CITY OF AUBURN WASHINGTON

AGENDA BILL APPROVAL FORM

Agenda Subject		**Date:**
Ordinance No. 6295 amending City of Auburn floodplain and flood hazard regulations currently specified in Chapter 15.68 (Flood Hazard Areas) of the Auburn City Code and referenced in Titles 14, 16, 17, and 18 of the Auburn City Code.		March 30, 2010
Department: Planning and Development	**Attachments:** (1) Ordinance No. 6295 (2) City of Auburn Regulatory Floodplain Map (3) Floodplain Habitat Assessment and Mitigation Regional Guidance, FEMA, January 2010 (4) Regional Guidance for Hydrologic and Hydraulic Studies, FEMA, January 2010	**Budget Impact:** N/A

Administrative Recommendation:
City Council introduce and adopt Ordinance No. 6295

Background Summary:

On November 17, 2008, Auburn City Council enacted a moratorium on development within the Federal Emergency Management Agency (FEMA) identified 100-year floodplain. This moratorium was enacted as a result of a finding (Biological Opinion) issued by the National Marine Fisheries Service (NMFS) that administration of the National Flood Insurance Program (NFIP) jeopardizes species protected under the Endangered Species Act (ESA). As a result of the NMFS finding, FEMA and communities participating in the NFIP are required to implement a series of actions, including adoption of regulations to ensure compliance with the ESA. The purpose of the moratorium was to give these federal agencies time to complete a model floodplain ordinance and other technical assistance for local jurisdictions, and in the interim, to limit liability to private parties and the City.

The City of Auburn has participated in the ongoing review of a model floodplain ordinance and related guidance documents being developed by FEMA, and has provided numerous review comments since mid 2009. Based on the City's understanding of the new NFIP requirements gained through participation in the NFIP model ordinance development process, staff is recommending that the City move forward at this time to adopt amendments to Titles 14, 15, 16, 17, and 18 relating to the City's floodplain development regulations to incorporate the ESA requirements contained in the NMFS Biological Opinion.

L0405-2
A3.11.12

Reviewed by Council & Committees:		**Reviewed by Departments & Divisions:**	
☐ Arts Commission	COUNCIL COMMITTEES:	☒ Building	☐ M&O
☐ Airport	☐ Finance	☐ Cemetery	☐ Mayor
☐ Hearing Examiner	☐ Municipal Services	☐ Finance	☒ Parks
☐ Human Services	☒ Planning & CD	☐ Fire	☒ Planning
☐ Park Board	☒ Public Works	☒ Legal	☐ Police
☒ Planning Comm.	☐ Other _____	☒ Public Works	☐ Human Resources

Action:
Committee Approval: ☒Yes ☐No
Council Approval: ☐Yes ☐No
Referred to _____ Call for Public Hearing Until ___/___/___
Tabled _____ Until ___/___/___

Councilmember: Norman	**Staff:** Snyder
Meeting Date: April 5, 2010	**Item Number:** IX.A.1

Agenda Subject	Date:
Ordinance No. 6295 amending City of Auburn floodplain and flood hazard regulations currently specified in Chapter 15.68 (Flood Hazard Areas) of the Auburn City Code and referenced in Titles 14, 16, 17, and 18 of the Auburn City Code.	March 30, 2010

Adoption of floodplain regulation amendments that meet the requirements of the NMFS Biological Opinion will address the underlying reason for the enactment of the floodplain development moratorium and allow for the moratorium to be discontinued.

On February 18, 2010, the City of Auburn submitted the proposed amendments to the Washington Department of Commerce and requested expedited state agency regulatory review pursuant to RCW 36.70A.106. On March 8, 2010, the City received notification from the Washington Department of Commerce that its request for expedited review had been granted.

On February 19, 2010, the City of Auburn issued a duly noticed SEPA Determination of Non-Significance File No. SEP10-0007 for the proposed amendment of floodplain and flood hazard regulations specified in Chapter 15.68 (Flood Hazard Areas) of the Auburn City Code and referenced in Titles 14, 16, 17, and 18 of the Auburn City Code.

On February 23, 2010, the Auburn Planning Commission held a duly noticed public hearing, and upon conclusion of the hearing and the Commission's further discussion and deliberation did then recommend by positive motion vote to forward the proposed amendments to the City Council for consideration and adoption action.

On March 1, 2010, the Public Works Committee reviewed and discussed the proposed amendments at a regular meeting of the Committee. Committee members requested that staff refine and clarify Section 11 of the draft ordinance entitled "Effect of subsequent amendments". The ordinance was subsequently revised to address the refinements requested by the Public Works Committee, to include amendment of the City of Auburn Fee Schedule for floodplain development permits and associated reviews, and to include a provision for third party review of habitat impact assessments and mitigation plans.

On March 8, 2010, the Planning and Community Development Committee reviewed the proposed amendments and approved forwarding Ordinance No. 6295 to the full City Council for adoption.

On March 9, 2010, the Federal Emergency Management Agency issued a revised model ordinance relating to floodplain management and the Endangered Species Act and associated regional guidance documents for public review, with a public comment period of March 9, 2010 to April 8, 2010. The FEMA regional guidance addressing habitat mitigation and hydrologic and hydraulic studies are referenced in the proposed amendments, copies of which are included as Attachments #3 and #4.

On March 15, 2010, the Public Works Committee reviewed changes to the proposed amendments recommended by staff as a result of the revisions to the FEMA model ordinance.

On March 22, 2010, the Planning and Community Development Committee reviewed the recommended changes to the proposed amendments and approved forwarding a revised Ordinance No. 6295 (Attachment #1) to the full City Council for adoption. A proposed City of Auburn Regulatory Floodplain Map as referenced in the proposed amendments is attached as Attachment #2.

ORDINANCE NO. 6295

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF AUBURN, WASHINGTON, RELATING TO FLOODPLAIN MANAGEMENT REGULATIONS; ADOPTING REGULATIONS INCORPORATING FEDERAL HABITAT PROTECTION REQUIREMENTS INTO EXISTING REGULATIONS, ESTABLISHING REQUIREMENTS FOR A FLOODPLAIN DEVELOPMENT PERMIT, UPDATING RELATED PROVISIONS OF LAW, AND AMENDING CHAPTERS 14.03 AND 15.68, AND SECTIONS 16.10.010, 16.10.070, 17.04.300, 17.09.050, AND 17.14.110 OF THE AUBURN CITY CODE, AND CREATING NEW SECTIONS 17.04.305, 17.04.335 AND 18.70.025 OF THE AUBURN CITY CODE, AND REPEALING SECTION 17.04.045 OF THE AUBURN CITY CODE CONNECTED THEREWITH

WHEREAS, the City is required, as a condition of continued eligibility in the National Flood Insurance Program (NFIP) to adopt floodplain management regulations that meet the requirements of the federal flood plain management criteria for flood-prone areas in the Code of Federal Regulations (44CFR 60.3) ; and

WHEREAS, the City currently regulates floodplain management by using a combination of specific floodplain management regulations, critical area regulations, shoreline management regulations, and State Environmental Policy Act (SEPA) regulations; and

WHEREAS, in October, 2008, the City received notice from the Federal Emergency Management Administration (FEMA) and the National Marine Fisheries Service (NMFS) that those agencies had collaborated on a position paper that seeks to prevent continued degradation of existing floodplain, and to promote low impact development in floodplain areas of the region that could effect endangered species; and

WHEREAS, FEMA and NMFS took the position that if a permitting agency, such as the City of Auburn, grants permits in floodplain areas within its boundaries that are later determined to adversely affect the floodplains and/or endangered species, the permitting agency will be liable for the resulting "take" on endangered species; and

WHEREAS, in response to the position taken by the federal agencies, the City imposed a moratorium on development in floodplains within the City, which moratorium continues to be in effect; and

WHEREAS, FEMA, in consultation with NMFS, began working on a model ordinance that, if substantively adopted by local jurisdictions, would allow those jurisdictions to resume permitting development in the floodplain. The provisions of the model ordinance are intended to help ensure that impacts on the floodplain and on habitat were properly evaluated and, if necessary, mitigated; and

WHEREAS, the federal agencies invited several local jurisdictions, including Auburn, to participate in a focus group during the development of this model ordinance; and

WHEREAS, although federal agencies incorporated some of the suggestions from the local jurisdictions, the substantive requirements that the local jurisdictions must adopt are mandated by the federal agencies and are not subject to modification by the local jurisdictions.

WHEREAS, the federal agencies must approve the City's incorporation of the substantive terms of the model ordinance; however, the provisions of model ordinance provide sufficient guidance to allow the City to resume processing development permits in the floodplain in compliance with the interim measure required by NMFS; and

WHEREAS, It is the Council's intention to adopt the below stated regulations as interim regulations until such time as the federal agencies approve them as permanent measures, at which time they shall become permanent regulations.

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF AUBURN, WASHINGTON, DO ORDAIN as follows:

Section 1. Amendment to City Code. Chapter 14.03 of the Auburn City Code be and the same hereby is amended to read as follows:

Chapter 14.03
TYPES OF PROJECT PERMIT DECISIONS

Sections:

14.03.001 Generally.

Project permit decisions are classified into five types, based on whether a director, the hearing examiner or the city council makes the decision and the process by which that decision is made. (Ord. 4835 § 1, 1996.)

14.03.010 Type I decisions.

Type I decisions are administrative decisions made by the city which are not subject to environmental review under the State Environmental Policy Act (SEPA) codified at Chapter 43.21C RCW. Type I decisions include, but are not limited to, the following project applications:

A. Building permit;
B. Plumbing permit;
C. Mechanical permit;
D. Utility permit;
E. Special permit;
F. Excavation permit;
G. Land clearing permit;
H. Grading permit;
I. Floodplain development ~~control zone~~ permit;
J. Public facility extension agreement;

K. Right-of-way use permit;
L. Lot line adjustment;
M. Home occupation permit;
N. Temporary use permit (administrative);
O. Administrative use permit;
P. Short subdivision (plat);
Q. Mobile home closure plans. (Ord. 5746 § 2, 2003; Ord. 4835 § 1, 1996.)

14.03.020 Type II decisions.

Type II decisions are administrative decisions made by the city which include threshold determinations under SEPA. Type II decisions include, but are not limited to, the following project applications:

A. Building permit;
B. Grading permit;
C. Land clearing permit;
D. Public facility extension agreement;
E. Administrative use permit;
F. Short subdivision (plat).
G. Floodplain development permit. (Ord. 4835 § 1, 1996.)

14.03.030 Type III decisions.

Type III decisions are quasi-judicial final decisions made by the hearing examiner following a recommendation by staff. Type III decisions include, but are not limited to, the following project applications:

A. Temporary use permit;
B. Substantial shoreline development permit;
C. Variance;
D. Special exceptions;
E. Special home occupation permit;
F. Preliminary plat;
G. Conditional use permit;
H. Surface mining permit. (Ord. 6184 § 3, 2008; Ord. 4835 § 1, 1996.)

14.03.040 Type IV decisions.

Type IV decisions are quasi-judicial decisions made by the city council following a recommendation by the hearing examiner. Type IV decisions include, but are not limited to, the following project applications:

Rezone (site-specific). (Ord. 6184 § 4, 2008; Ord. 4835 § 1, 1996.)

14.03.050 Type V decisions.

Type V decisions are quasi-judicial decisions made by the city council following a recommendation by staff. Type V decisions include, but are not limited to, the following project applications:

Final plat. (Ord. 6184 § 5, 2008; Ord. 4835 § 1, 1996.)

14.03.060 Legislative nonproject decisions.

Legislative nonproject decisions made by the city council under its authority to establish policies and regulations are not classified as a "type" of project permit decision. Legislative nonproject decisions include, but are not limited to, the following legislative actions:

A. Amendments to the text and map of the comprehensive plan or development regulations.

B. Amendments to the zoning map (rezones) on a city-wide or area-wide basis. (Ord. 4835 § 1, 1996.)

Section 2. Amendment to City Code. Chapter 15.68 of the Auburn City Code be and the same hereby is amended to read as follows:

Chapter 15.68
FLOOD HAZARD AREAS[1]

Sections:

Article I. Statutory Authorization, Findings of Fact, Purpose and Objectives

Article II. Definitions

Article III. General Provisions

Article IV. Administration

[1] Prior Legislation: Ords. 4214 and 4220.

15.68.130 Establishment of and requirement to obtain floodplain development permit.
15.68.135 Floodplain development permit application.
15.68.136 Floodplain development permit expiration.
15.68.140 ~~*Repealed.*~~ Designation of floodplain administrator.
15.68.141 Duties of the floodplain administrator.
15.68.150 Duties and responsibilities of the ~~city engineer~~ public works department.
15.68.151 Duties and responsibilities of the ~~city of auburn building division~~ planning and development department.

Article V. Provisions for Flood Hazard Protection

15.68.160 ~~General standards~~ Standards of the ~~city of Auburn engineering division~~ public works department.
15.68.161 ~~General standards~~ Standards of the ~~city of Auburn building division~~ planning and development department.
15.68.170 ~~Specific~~ Additional standards of the ~~city of Auburn building division~~ planning and development department.
15.68.180 Floodways and community acknowledgement of FEMA map amendments.
15.68.190 Development within areas of special flood hazard.
15.68.200 Compensatory storage ~~equipment~~requirements.

Article I. ~~Statutory Authorization, Findings of Fact,~~ Purpose ~~and Objectives~~

15.68.010 RESERVED ~~Statutory authorization.~~

~~The legislature of the state of Washington has in state law delegated the responsibility to local governmental units to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry. Therefore, the city council of the city of Auburn, Washington, does ordain as follows in this chapter. (Ord. 6161 § 1, 2008; Ord. 4820 § 1, 1995; Ord. 4357 § 2(1.1), 1989.)~~

15.68.020 RESERVED ~~Findings of fact.~~

~~A. The flood hazard areas of the city are subject to periodic inundation which results in loss of life and property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief, and impairment of the tax base, all of which adversely affect the public health, safety and general welfare.~~

~~B. These flood losses are caused by the cumulative effect of obstructions in areas of special flood hazard which increase flood heights and velocities and, when inadequately anchored, damage uses in other areas. Uses that are inadequately floodproofed, elevated or otherwise protected from flood damage also contribute to the flood loss. (Ord. 6161 § 1, 2008; Ord. 4820 § 1, 1995; Ord. 4357 § 2(1.2), 1989.)~~

15.68.030 Statement of purpose.

It is the purpose of this chapter to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed:

A. To protect human life, ~~and~~ health, and to protect property;

B. To minimize expenditure of public money and costly flood control projects;

C. To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;

D. To minimize prolonged business interruptions;

E. To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in areas of special flood hazard;

F. To help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future flood blight areas;

G. To ensure that potential buyers are notified that property is in an area of special flood hazard; and

H. To ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.

I. To qualify the City of Auburn for participation in the National Flood Insurance Program, thereby giving citizens and businesses the opportunity to purchase flood insurance;

J. To maintain the quality of water in rivers, streams, and lakes, and their floodplains so as to protect public water supplies, areas of the Public Trust, and wildlife habitat protected by the Endangered Species Act;

K. To retain the natural channel, shoreline, and floodplain creation processes and other natural floodplain functions that protect, create, and maintain habitat for threatened and endangered species; and

L. To prevent or minimize loss of hydraulic, geomorphic, and ecological functions of floodplains and stream channels. (Ord. 6161 § 1, 2008; Ord. 4820 § 1, 1995; Ord. 4357 § 2(1.3), 1989.)

15.68.040 Methods of reducing flood losses.

In order to accomplish its purposes, this chapter includes methods and provisions for:

A. Restricting or prohibiting uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion or in flood heights or velocities;

B. Requiring that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;

C. Controlling the alteration of natural floodplains, stream channels, and natural protective barriers, which help accommodate or channel floodwaters;

D. Controlling filling, grading, dredging, and other development which may increase flood damage; and

E. Preventing or regulating the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards in other areas.

F. Identifying the Regulatory Floodplain, the Special Flood Hazard Area, and the Protected Area and the supporting technical data needed to delineate those areas.

G. Establishing a permit requirement so that all human development that may affect flood hazards, water quality, and habitat is reviewed before it is constructed.

H. Setting minimum protection standards for all development to ensure that the development will not increase the potential for flood damage or adversely affect natural floodplain functions.

I. Setting minimum standards to protect new and substantially improved structures from flood damage.

J. Specifying additional habitat protection criteria. Some projects do not need a floodplain permit (*see* ACC 15.68.130B, C); whereas other projects require a floodplain permit, but do not require the habitat impact assessment required in this chapter (see ACC 15.68.130D). For all other development projects, the applicant must assess their impact on those factors that contribute to increased flood hazard and degradation of habitat. If the assessment concludes that there will be an adverse effect, the permit will be denied, unless the project is redesigned to mitigate the adverse effects. (Ord. 6161 § 1, 2008; Ord. 4820 § 1, 1995; Ord. 4357 § 2(1.4), 1989.)

Article II. Definitions

15.68.050 Interpretation of language.

Unless specifically defined in this article, words or phrases used in this chapter shall be interpreted so as to give them the meaning they have in common usage and to give this chapter its most reasonable application. (Ord. 6161 § 1, 2008; Ord. 4820 § 1, 1995; Ord. 4357 § 2(2.0), 1989.)

15.68.060 Definitions.

As used in this chapter:

~~A. "Appeal" means a request for a review of the city engineering division's interpretation of any provisions of this chapter or a request for a variance.~~

~~B. "Area of shallow flooding" means a designated AO or AH zone on the Flood Insurance Rate Map (FIRM). The base flood depths range from one to three feet; a clearly defined channel does not exist; the path of flooding is unpredictable and indeterminate; and velocity flow may be evident. AO is characterized as sheet flow and AH indicates ponding.~~

~~C. "Area of Special Flood Hazard": the land in the floodplain within a community subject to a one percent or greater chance of flooding in any given year. Designation on maps always includes the letters A or V.~~

~~D~~ A. "**Adversely affect/Adverse effect**" means effects that are a direct or indirect result of the proposed action or its interrelated or interdependent actions and the effect is not discountable, insignificant or beneficial, where:

1. a. Discountable effects are extremely unlikely to occur; and

b. Insignificant effects relate to the size of the impact and should never reach the scale where a take occurs. Based on best

judgment, a person would not be able to meaningfully measure, detect, or evaluate insignificant effects, or expect discountable effects to occur.

2. Beneficial effects are contemporaneous positive effects without any adverse effects. In the event that the overall effect of the proposed action is beneficial, but is also likely to cause some adverse effects, then the proposed action is considered to result in an adverse effect.

B. "Base flood" means the flood having a one percent chance of being equaled or exceeded in any given year. Also referred to as the "100-year flood." The area subject to the base flood is the Special Flood Hazard Area (SFHA) designated on Flood Insurance Rate Maps as Zones "A," including AE, AO, AH, and A1-99.

C. "Base Flood Elevation" means the elevation of the base flood above the datum of the effective FIRM.

1. The base flood elevation for the SFHAs of the City shall be as delineated on the 100 year flood profiles in the Flood Insurance Study for the City.

2. The base flood elevation for each SFHA delineated as a "Zone AH" or "Zone AO" shall be that elevation (or depth) delineated on the Flood Insurance Rate Map. Where base flood depths are not available in Zone AO, the base flood elevation shall be considered to be two feet above the highest grade adjacent to the structure.

3. Where base flood elevation data are not provided on the Flood Insurance Study for the City, base flood elevation data available from a Federal, State, or other authoritative source shall be used, if available. Where base flood elevation data are not available from other authoritative sources, applicants for approval of new subdivisions and other proposed developments (including proposals for manufactured home parks and subdivisions) greater than 50 lots or 5 acres, whichever is the lesser, shall include such data with their permit applications. This data must be approved by the Floodplain Administrator.

~~E~~D. "Basement" means any area of the ~~building~~ structure having its floor subgrade (below ground level) on all sides.

E. "Channel Migration Area" means the area within the lateral extent of likely stream channel movement due to stream bank destabilization and erosion, rapid stream incision, aggradation, avulsions, and shifts in location of stream channels plus 50 feet.

1. The channel migration area shall be the total area occupied by the River Channel, the Severe Channel Migration Hazard Area, and the Moderate Channel Migration Hazard Area as delineated in the Green River Channel Migration Study published by King County dated December 1993 plus 50 feet.

2. Where more than one channel migration zone has been delineated, the floodplain administrator shall use the delineation that has been adopted for other local regulatory purposes.

F. "Critical Facility" means a facility necessary to protect the public health, safety and welfare during a flood. Critical facilities include, but are not limited to, schools, nursing homes, hospitals, police, fire and emergency operations installations, water and wastewater treatment plants, electric power stations, and installations which produce, use, or store hazardous materials or hazardous waste (other than consumer products containing hazardous substances or hazardous waste intended for household use).

~~F~~G. "Development" means any manmade change to improved or unimproved real estate in the Regulatory Floodplain, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials, subdivision of land, removal of more than 5% of the native vegetation on the property, or alteration of natural site characteristics.

H. "Dry Floodproofing" means any combination of structural and non structural measures that prevent flood waters from entering a structure.

I. "Elevation Certificate" means the official form (FEMA Form 81-31) used to provide elevation information necessary to ensure compliance with provisions of this ordinance and determine the proper flood insurance premium rate.

J. "Equivalent Elevation" means having similar relationship to ordinary high water and to the best available 10-year, 50-year and 100-year water surface profiles.

K. "FEMA" means the Federal Emergency Management Agency, the agency responsible for administering the National Flood Insurance Program.

L. "Fish and Wildlife Habitat Conservation Area" means lands needed to maintain species in suitable habitats within their natural geographic distribution so that isolated subpopulations are not created. These areas are designated by the City pursuant to the Washington State Growth Management Act (WAC 365-190-080).

~~G~~M. "Flood" or "flooding" means a general and temporary condition of partial or complete inundation of normally dry land areas from:

1. The overflow of inland or tidal waters; and/or
2. The unusual and rapid accumulation of runoff of surface waters from any source.

~~H~~N. "Flood Insurance Rate Map (FIRM)" means the official map on which the Federal Insurance Administration has delineated both the areas of special flood hazard and the risk premium zones applicable to the community.

~~I~~O. "Flood Insurance Study" means the official report(s) provided by the Federal Insurance Administration that includes flood profiles, the Flood ~~Boundary-Floodway~~ Insurance Rate Map, and the water surface elevation of the base flood.

P. "Flood Protection Elevation (FPE)" means the elevation above the datum of the effective FIRM to which new and substantially improved structures must be protected from flood damage.

~~J~~Q. "Floodway" means the channel of a stream ~~river~~ or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot. The floodway shall be as delineated on the Flood Insurance Rate Map. Where floodway data are not provided on the Flood Insurance Study for the City, floodway data available from a Federal, State, or other authoritative source shall be used, if available. Where floodway data is not available from another authoritative source, applicants for approval of new subdivisions and other proposed developments (including proposals for manufactured home parks and subdivisions) greater than 50 lots or 5 acres, whichever is the lesser, shall include such data with their permit applications. This data must be approved by the Floodplain Administrator. This provision does not apply to applications for permits for small projects on large lots, such as constructing a single family home.

R. "Historic Structure" means a structure that:

1. Is listed on the National Register of Historic Places, the Washington Heritage Register, or the Washington Heritage Barn Register, or has been designated a landmark or been issued a Certificate of Appropriateness under the City's Historic Preservation Ordinance.

2. Has been certified to contribute to the historical significance of a registered historic district.

S. "Hyporheic Zone" means a saturated layer of rock or sediment beneath and/or adjacent to a stream channel that contains some proportion of channel water or that has been altered by channel water infiltration.

T. "Impervious Surface" means a hard surface area which causes water to run off the surface in greater quantities or at an increased rate of flow from the flow present under natural conditions prior to development. Common impervious surfaces include, but are not limited to, roof tops, walkways, patios, driveways, parking lots or storage areas, concrete or asphalt paving, gravel roads, packed earthen materials, and oiled, macadam or other surfaces which similarly impede the natural infiltration of stormwater.

~~K~~U. "Lowest floor" means the lowest floor of the lowest enclosed area (including basement) measured at the walking surface of the floor. An unfinished or flood-resistant enclosure, usable solely for parking of vehicles, building access or storage, in an area other than a basement area is not considered a building's lowest floor~~; provided~~, as long as that ~~such~~ enclosure is not built so as to render the structure in violation of the applicable nonelevation design requirements of this chapter found in ACC ~~15.68.170A(2)~~ 15.68.170A(7).

V. "Manufactured home" means a structure, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when connected to the required utilities. For floodplain management purposes, the term "manufactured home" also includes park trailers, travel trailers, and other similar recreational vehicles placed on a site for greater than 180 consecutive days. For insurance purposes, the term "manufactured home" does not include park trailers, travel trailers, and other similar recreational vehicles.

~~M~~W. "Manufactured home park or subdivision" means a parcel (or contiguous parcels) of land divided into two or more manufactured home lots for rent or sale.

X. "Market value" shall mean the current assessed value as established by the most recent tax roll of the County Assessor in which the property is located. An applicant may, at applicant's expense, provide an appraisal to determine market value.

Y. "Native Vegetation" means plant species that are indigenous to the community's area and that reasonably could be expected to naturally occur on the site.

Z. "Natural Floodplain Functions" means the contribution that a floodplain makes to support habitat, including, but not limited to providing flood storage and conveyance, reducing flood velocities, reducing sedimentation, filtering nutrients and impurities from runoff, processing organic wastes, moderating temperature fluctuations, and providing breeding and feeding grounds for aquatic or riparian species.

~~N~~AA. "New construction" means structures for which the "start of construction" commenced on or after the effective date of the ordinance codified in this chapter.

BB. "Protected Area" means the lands that lie within the boundaries of the floodway, the riparian habitat zone, and the channel migration area. In riverine areas, where a floodway has not been designated in accordance with this Chapter, the Protected Area is comprised of those lands that lie within the boundaries of the riparian habitat zone, the channel migration area, and the SFHA.

~~O~~CC. "Recreational vehicle" means a vehicle:

1. Built on a single chassis;

2. Four hundred square feet or less when measured at the largest horizontal projection;

3. Designed to be self-propelled or permanently towable by a light-duty truck; and

4. Designed primarily not for use as a permanent dwelling but as temporary living quarters for recreation, camping, travel, or seasonal use.

DD. "Regulatory Floodplain" means the area of the Special Flood Hazard Area and all Protected Areas within the City of Auburn. It also includes newly designated Special Flood Hazard Areas and Protected Areas that are delineated pursuant to City Law.

EE. "Riparian" means of, adjacent to, or living on, the bank of a stream, lake, pond, sound, or other water body.

FF. "Riparian Habitat Zone" means the water body and adjacent land areas that are likely to support aquatic and riparian habitat as detailed in this chapter. The size and location of the riparian habitat zone is dependent on the type of water body. The riparian habitat zone includes the water body and adjacent lands, measured perpendicularly from ordinary high water on both sides of the water body:

1. Marine and lake shorelines and Type S streams that are designated "shorelines of the State:" 250 feet.

2. Type F streams (fish bearing) streams greater than 5 feet wide and marine shorelines: 200 feet.

3. Type F streams less than 5 feet wide and lakes: 150 feet.

4. Type N (nonsalmonid-bearing) perennial and seasonal streams with unstable slopes: 225 feet.

5. All other Type N (nonsalmonid-bearing) perennial and seasonal streams: 150 feet.

In addition, the riparian habitat zone may include additional land areas that the Floodplain Administrator determines are likely to support aquatic and riparian habitat.

GG. "Special Flood Hazard Area (SFHA)" means the land subject to inundation by the base flood. Special Flood Hazard Areas are identified by the Federal Emergency Management Agency in the scientific and engineering reports entitled "Flood Insurance Study for King County, Washington and Incorporated Areas" dated April 19, 2005, and any revisions thereto, and "Flood Insurance Study for Pierce County, Washington and Unincorporated Areas" dated August 19, 1987, and any revisions thereto, and designated on associated Flood Insurance Rate Maps with the letters "A" including AE, AO, AH, A1-99.

~~P~~HH. "Start of construction" includes substantial improvement, and means ~~the date the building permit was issued; provided the~~ actual start of construction, repair,

reconstruction, addition, placement or other improvement ~~was within 180 days of the permit date~~ that occurred before the permit's expiration date. The actual start means either the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation; or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for a basement, footings, piers, or foundation or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure. For a substantial improvement, the actual start of construction means the first alteration of any wall, ceiling, floor, or other structural part of a building, whether or not that alteration affects the external dimensions of the building.

~~Q~~II. "Structure" means a walled and roofed building including a gas or liquid storage tank that is principally above ground.

JJ. "Substantial Damage: means damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

~~R~~KK. "Substantial improvement" or "substantially improved" means any repair, reconstruction, addition, replacement or improvement of a structure, the cost of which equals or exceeds 50 percent of the ~~assessed valuation~~ market value of such structure ~~as established by the most current King County or Pierce County assessor's tax roll either:~~

~~1. Before the improvement or repair is started; or~~

~~2. If the structure has been damaged and is being restored, before the damage occurred. For the purposes of this definition, "substantial improvement" is considered to occur when the first alteration of any wall, ceiling, floor, or other structural part of the building commences, whether or not that alteration affects the external dimensions of the structure~~ before the "start of construction" of the improvement. This term includes structures that have incurred "substantial damage," regardless of the actual repair work done.

The term does not, however, include either:

1. Any project for improvement of a structure to ~~comply with~~ correct existing violations of state or local health, sanitary, or safety code specifications ~~which are solely~~ that have been identified by the local code enforcement official and that are the minimum necessary to assure safe living conditions; or

2. Any alteration of a structure listed on the National Register of Historic Places or a State Inventory of Historic Places.

~~S~~LL. "Variance" means a grant of relief from the requirements of this chapter which permits construction in a manner that would otherwise be prohibited by this chapter.

MM. "Water Typing" means a system for classifying water bodies according to their size and fish habitat characteristics. The Washington Department of Natural

Resources' Forest Practices Water Typing classification system is herby adopted by reference. The system defines four water types:

1. Type "S" = Shoreline: Streams that are designated "shorelines of the State," including marine shorelines

2. Type "F" = Fish: Streams that are known to be used by fish or meet the physical criteria to be potentially used by fish.

3. Type "Np" = Non-Fish Perennial streams

4. Type "Ns" = Non-Fish Seasonal streams

NN. "Zone" means one or more areas delineated on the FIRM. The following zones may be used on the adopted FIRM. The Special Flood Hazard Area is comprised of the A Zone.

(a) A: SFHA where no base flood elevation is provided.

(b) A#: numbered A Zones (e.g., A7 or A14), SFHA with a base flood elevation.

(c) AE: SFHA with a base flood elevation.

(d) AO: SFHA subject to inundation by shallow flooding usually resulting from sheet flow on sloping terrain, with average depths between one and three feet. Average flood depths are shown.

(e) AH: SFHA subject to inundation by shallow flooding (usually areas of ponding) with average depths between one and three feet. Base flood elevations are shown.

(f) B: the area between the SFHA and the 500-year flood of the primary source of flooding. It may also be an area with a local, shallow flooding problem or an area protected by a levee.

(g) C: an area of minimal flood hazard, as above the 500-year flood level of the primary source of flooding. B and C Zones may have flooding that does not meet the criteria to be mapped as a Special Flood Hazard Area, especially ponding and local drainage problems.

(h) D: area of undetermined but possible flood hazard.

(i) X: the area outside the mapped SFHA.

(j) Shaded X: the same as a Zone B, above. (Ord. 6161 § 1, 2008; Ord. 4820 § 1, 1995; Ord. 4357 § 2(2.1 – 2.17), 1989.)

Article III. General Provisions

15.68.070 Land to which this chapter applies.

This chapter shall apply to the Regulatory Floodplain ~~all areas of special flood hazards~~ within the jurisdiction of the city. (See ~~Exhibit "A," attached to the ordinance codified in this chapter and incorporated herein by reference,~~ the ~~State Flood Control Zone~~ City of Auburn Regulatory Floodplain Map on file in the Office of the city Clerk). (Ord. 6161 § 1, 2008; Ord. 4820 § 1, 1995; Ord. 4357 § 2(3.1), 1989.)

15.68.080 Reserved. ~~Basis for establishing the areas of special flood hazard.~~

~~The areas of special flood hazard identified by the Federal Insurance Administration in a scientific and engineering report entitled "The Flood Insurance Study~~

~~for the City of Auburn," dated May 16, 1995, and any revisions thereto, with an accompanying Flood Insurance Rate Map (FIRM), and any revisions thereto, are hereby adopted by reference and declared to be a part of this chapter. The Flood Insurance Study and FIRM are on file at 25 West Main, Auburn, Washington 98001. The best available information for flood hazard area identification as outlined in ACC 15.68.150(B) shall be the basis for regulation until a new FIRM is issued that incorporates data utilized under ACC 15.68.150(B).~~ (Ord. 6161 § 1, 2008; Ord. 4820 § 1, 1995; Ord. 4357 § 2(3.2), 1989.)

15.68.090 Penalties for noncompliance.

No ~~structure or land shall hereafter be constructed, located, extended, converted, or altered~~ development shall be undertaken without full compliance with the terms of this chapter and other applicable regulations. Violation of the provisions of this chapter by failure to comply with any of its requirements (including violations of conditions and safeguards established in connection with conditions) shall be enforced pursuant to the provisions of Chapter 1.25 ACC. (Ord. 6161 § 1, 2008; Ord. 4820 § 1, 1995; Ord. 4502 § 20, 1991; Ord. 4357 § 2(3.3), 1989.)

15.68.100 Abrogation and greater restrictions.

This chapter is not intended to repeal, abrogate, or impair any existing easements, covenants, or deed restrictions. However, where this chapter and another ordinance, easement, covenant, or deed restriction conflict or overlap, whichever imposes the more stringent restrictions shall prevail. (Ord. 6161 § 1, 2008; Ord. 4820 § 1, 1995; Ord. 4357 § 2(3.4), 1989.)

15.68.110 Interpretation.

In the interpretation and application of this chapter, all provisions shall be:

A. Considered as minimum requirements;

B. Liberally construed in favor of the governing body; and

C. Deemed neither to limit nor repeal any other powers granted under state statutes.

D. Maps referred to in this Chapter are for reference only, unless specified. If the map does not specifically indicate that it is the primary source of regulation, the text of the applicable Code section shall control over any contrary information provide on a map. (Ord. 6161 § 1, 2008; Ord. 4820 § 1, 1995; Ord. 4357 § 2 (3.5), 1989.)

15.68.120 Warning and disclaimer of liability.

The degree of ~~flood~~ property and habitat protection required by this chapter is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. Larger floods and movement of channels outside of mapped channel migration areas can and will occur on rare occasions. Flood heights may be increased by manmade or natural causes. This chapter does not imply that land outside the areas of special flood hazard or uses permitted within such areas will be free from flooding or flood damages. This chapter does not imply that land outside the regulated areas or development permitted within such areas will be free from flood or

erosion damage. This chapter shall not create liability on the part of the city, any officer or employee thereof~~, or the Federal Insurance Administration~~, for any ~~flood~~ damages to property or habitat that results from reliance on this chapter or any administrative decision lawfully made thereunder. (Ord. 6161 § 1, 2008; Ord. 4820 § 1, 1995; Ord. 4357 § 2(3.6), 1989.)

15.68.125 Appeals.

A. The Hearing Examiner shall hear and decide appeals and requests for variances from the requirements of this chapter.

B. The Hearing Examiner shall hear and decide appeals when it is alleged there is an error in any requirement, decision, or determination made by the floodplain administrator in the enforcement or administration of this chapter.

C. Those aggrieved by the decision of the Hearing Examiner may appeal such decision to the Superior Court.

D. Upon consideration of the factors of this Chapter and the purposes of this chapter, the Hearing Examiner may attach such conditions to the granting of variances as it deems necessary to further the purposes of this chapter.

Article IV. Administration

15.68.130 Establishment of and requirement to obtain floodplain development permit.

A. A Floodplain development permit shall be obtained before construction or development begins within the Regulatory Floodplain~~any area of special flood hazard established in ACC 15.68.080~~. The permit shall be for all ~~structures including manufactured homes, as set forth in ACC 15.68.060, and for all other~~ development ~~including fill and other activities, also as set forth in ACC 15.68.060~~ as defined in this chapter. ~~Application for a development permit shall be made on forms furnished by the city and may include, but not be limited to, plans in duplicate drawn to scale showing the nature, location, dimensions, and elevations of the area in question; existing or proposed structures, fill, storage of materials, drainage facilities; and the location of the foregoing. Specifically, the following information is required:~~

~~1. Elevation in relation to mean sea level of the lowest floor (including basement) of all structures;~~

~~2. Elevation in relation to mean sea level to which any structure has been floodproofed;~~

~~3. Certification by a registered professional engineer that the floodproofing methods for any nonresidential structure meet the floodproofing criteria in ACC 15.68.170(B); and~~

~~4. Description of the extent to which any watercourse will be altered or relocated as a result of proposed development.~~

B. A development project is not subject to the requirements of this chapter if it is located on land that can be shown to be

1. Outside the Protected Area and

2. Higher than the base flood elevation.

The floodplain administrator shall inform the applicant that the project may still be subject to the flood insurance purchase requirements unless the owner receives a Letter of Map Amendment from FEMA.

C. Non-Development Activities. Activities that do not meet the definition of "development" in this chapter are allowed in the Regulatory Floodplain without the need for a floodplain development permit under this chapter, provided all other Federal, State, and local requirements are met. The following are examples of activities not considered development or "man-made changes to improved or unimproved real estate."

1. Routine maintenance of landscaping that does not involve grading, excavation, or filling;

2. Removal of noxious weeds and hazard trees and replacement of non-native vegetation with native vegetation;

3. Normal maintenance of structures, such as re-roofing and replacing siding, as long as such work does not qualify as a substantial improvement;

4. Normal maintenance of above ground public utilities and facilities, such as replacing downed power lines;

5. Normal street and road maintenance, including filling potholes, repaving, and installing signs and traffic signals, but not including expansion of paved areas.

6. Normal maintenance of a levee or other flood control facility prescribed in the operations and maintenance plan for the levee or flood control facility; and

7. Plowing and other normal farm practices (other than structures or filling) on farms in existence as of the effective date of this ordinance.

D. Activities Allowed With a Floodplain Permit. The following activities are allowed in the Regulatory Floodplain without the analysis required in Section 15.68.160C or the habitat impact assessment required under ACC 15.68.130K, providing all other requirements of this ordinance are met, including obtaining a floodplain development permit:

1. Repairs or remodeling of an existing structure, provided that the repairs or remodeling are not a substantial improvement or a repair of substantial damage. Provided further, that no habitat impact assessment shall be required if the repair or remodel does not expand the existing building envelope.

2. Expansion of an existing structure that is no greater than ten percent beyond its existing footprint, provided that the repairs or remodeling are not a substantial improvement or a repair of substantial damage. This measurement is counted cumulatively from the effective date of this ordinance. If the structure is in the floodway, there shall be no change in the dimensions perpendicular to flow.

3. Activities with the sole purpose of creating, restoring or enhancing natural functions associated with floodplains, streams, lakes, estuaries, marine areas, habitat, and riparian areas that meet Federal and State standards, provided the activities do not include structures, grading, fill, or impervious surfaces.

4. Development of open space and recreational facilities, such as parks, trails, and hunting grounds, that do not include structures, grading, fill, impervious surfaces or removal of more than 5% of the native vegetation on that portion of the property in the Regulatory Floodplain.

E. Other Activities

All other activities not listed in 15.68.130C or D are allowed, as long as they meet all the other requirements of this ordinance, including the analysis required in Section 15.68.160 and the habitat impact assessment and any mitigation required under Section 15.68.135K and Section 16.58.135L and a floodplain development permit is issued.

~~B. Permitting procedures for flood control zone permits shall conform to Section 3 of Auburn City Ordinance No. 4195 passed on December 15, 1986.~~ (Ord. 6161 § 1, 2008; Ord. 4820 § 1, 1995; Ord. 4357 § 2(4.1), 1989.)

15.68.135 Floodplain Development Permit Application.

Application for a floodplain development permit shall be made on forms furnished by the floodplain administrator and shall include, but not be limited to,

A. One or more site plans, drawn to scale, showing:

1. The nature, location, dimensions, and elevations of the property in question,

2. Names and location of all lakes, water bodies, waterways and drainage facilities within 300 feet of the site,

3. The elevations of the 10-, 50-, 100-, and 500-year floods, where the data are available. Additionally, for property located within the SFHA, base flood elevations for shall be included as required in ACC 15.68.060.B.3,

4. The boundaries of the Regulatory Floodplain, SFHA, floodway, riparian habitat zone, and channel migration area, delineated in accordance with this chapter,

5. The proposed drainage system including, but not limited to storm sewers, overland flow paths, detention facilities and roads,

6. Existing and proposed structures, fill, pavement and other impervious surfaces, and sites for storage of materials,

7. All wetlands,

8. Designated fish and wildlife habitat conservation areas, and

9. Existing native vegetation and proposed revegetation (see ACC 15.68.161D).

B. If the proposed project involves regrading, excavation, or filling, the site plan shall include proposed post-development terrain at one foot contour intervals.

C. If the proposed project includes a new structure, substantial improvement, or repairs to a substantially damaged structure that will be elevated, the application shall include the FPE for the building site and the proposed elevations of the following:

1. The top of bottom floor (including basement, crawlspace, or enclosure floor)

2. The top of the next higher floor

3. The top of the slab of an attached garage

4. The lowest elevation of machinery or equipment servicing the structure

5. The lowest adjacent (finished) grade next to structure

6. The highest adjacent (finished) grade next to structure

7. The lowest adjacent grade at the lowest elevation of a deck or stairs, including structural support

D. If the proposed project includes a new structure, substantial improvement, or repairs to a substantially damaged nonresidential structure that will be dry

floodproofed, the application shall include the FPE for the building site and the elevation in relation to the datum of the effective FIRM to which the structure will be dry floodproofed and a certification by a registered professional engineer or licensed architect that the dry floodproofing methods meet the floodproofing criteria in this chapter.

E. The application shall include a description of the extent to which a stream, lake, or other water body, including its shoreline, will be altered or relocated as a result of the proposed development.

F. The application shall include documentation that the applicant will apply for all necessary permits required by Federal, State, or local law. The application shall include acknowledgment that the applicant understands that the final certificate of occupancy will be issued only if the applicant provides copies of the required Federal, State, and local permits or letters stating that a permit is not required.

G. The application shall include acknowledgment by the applicant that representatives of any Federal, State or local unit of government with regulatory authority over the project are authorized to enter upon the property to inspect the development.

H. The riparian habitat zone shall be delineated on the site plan by the applicant at the time of application for sub-division approval or floodplain development permit for all development proposals within 300 feet of any stream or shoreline.

I. If the project is located in the Regulatory Floodplain and includes activities not listed in ACC 15.68130C and D, the application shall include a Habitat Impact Assessment. If that Assessment determines that impacts would result from the project, the application shall also include a Habitat Mitigation Plan.

J. Habitat Impact Assessment

Unless allowed under ACC 15.68.130C or D, an application to develop in the Regulatory Floodplain shall include an assessment of the impact of the project on water quality and aquatic and riparian habitat. The assessment shall be:

1. A Biological Evaluation or Biological Assessment that has received concurrence from the US Fish and Wildlife Service or the National Marine Fisheries Service, pursuant to Section 7 of the Endangered Species Act; or

2. Documentation that the activity fits within a Habitat Conservation Plan approved pursuant to Section 10 of the Endangered Species Act; or

3. Documentation that the activity fits within Section 4(d) of the Endangered Species Act; or

4. An assessment prepared in accordance with Regional Guidance for Floodplain Habitat Assessment and Mitigation, FEMA Region X, 2010. The assessment shall determine if the project would adversely affect:

(a) The primary constituent elements identified when a species is listed as threatened or endangered,

(b) Essential Fish Habitat designated by the National Marine Fisheries Service,

(c) Fish and wildlife habitat conservation areas,

(d) Vegetation communities and habitat structures,

(e) Water quality,

(f) Water quantity, including flood and low flow depths, volumes and velocities,

(g) The channel's natural planform pattern and migration processes,

(h) Spawning substrate, if applicable, and/or

(i) Floodplain refugia, if applicable.

K. Habitat Mitigation Plan

1. If the assessment conducted under ACC 15.68.135J concludes the project is expected to have an adverse effect on water quality and/or aquatic or riparian habitat or habitat functions, the applicant shall provide a plan to mitigate those impacts, in accordance with Regional Guidance for Floodplain Habitat Assessment and Mitigation, FEMA Region X, 2010.

(a) For projects or those portions of a project located within the Regulatory Floodplain but outside of the Protected Area, the mitigation plan shall include such avoidance, minimization, restoration, or compensation measures as are appropriate to mitigate the adverse effects of the project.

(b) For projects or those portions of a project located within the Protected Area, the project shall be revised to include such appropriate measures as are needed to ensure that there is no adverse effect due to the project. Minimization measures are not allowed in the Protected Area, unless they, in combination with other measures, result in no adverse effect.

2. The plan's habitat mitigation activities shall be incorporated into the proposed project. The floodplain development permit shall be based on the redesigned project and its mitigation components.

L. Third-Party Review.

For the habitat impact assessment required in ACC 15.68.135(K) or the habitat mitigation plan required in ACC 15.68.135 (L), the City may require third-party review when the professional opinions of the applicant's representative and the City's reviewers cannot be reconciled. Third-party review requires the applicant's habitat impact assessment, habitat mitigation plan, and/or additional technical studies to be reviewed by an independent third party, paid for by the applicant but hired by the City. Third-party review shall be conducted by a qualified consultant as defined in the Floodplain Habitat Assessment and Mitigation Regional Guidance, FEMA Region X, 2010.

15.68.136 Floodplain Development Permit Expiration.

If there has been no start of construction, a floodplain development permit shall expire 180 days after the date of issuance. Where the applicant documents a need for an extension beyond this period due to conditions beyond the applicant's control, the floodplain administrator may authorize one or more extensions.

15.68.140 Designation of the Floodplain Administrator.[2]

[2] NOTE: The City Code Section 15.68.140, entitled Designation of the city of Auburn engineering division, was repealed by Ord. 6161. (*See also* Ord. 4820 § 1, 1995; Ord. 4357 § 2(4.2), 1989.)

The Director of the planning and development department, or the Director's designee, is hereby appointed to administer and implement this Chapter by granting or denying floodplain development permit applications in accordance with its provisions.

15.68.141 Duties of the Floodplain Administrator.

Duties of the floodplain administrator shall include, but not be limited to:

A. Review all floodplain development permits to determine that the permit requirements of this ordinance have been satisfied.

B. Review all floodplain development permits to determine that all necessary permits have been obtained from those Federal, State, or local governmental agencies from which prior approval is required, including those local, State or Federal permits that may be required to assure compliance with the Endangered Species Act and/or other appropriate State or Federal laws.

C. Review all floodplain development permits to determine if the proposed development is located in the Protected Area. If located in the Protected Area, ensure that the applicable provisions of this chapter are met.

D. Ensure that all development activities within the Regulatory Floodplain of the City meet the requirements of this ordinance.

E. Inspect all development projects before, during and after construction to ensure compliance with all provisions of this ordinance, including proper elevation of the structure.

F. Maintain for public inspection all records pertaining to the provisions of this chapter.

G. Submit reports as required for the National Flood Insurance Program.

H. Notify FEMA of any proposed amendments to this ordinance.

I. Cooperate with State and Federal agencies to improve flood and other technical data and notify FEMA of any new data that would revise the FIRM.

J. Make interpretations where needed, as to the exact location of the boundaries of the Regulatory Floodplain, the SFHA and the Protected Area (e.g., where there appears to be a conflict between the mapped SFHA boundary and actual field conditions as determined by the base flood elevation and ground elevations).

15.68.150 Duties and responsibilities of the ~~city engineer~~public works department.

Duties of the ~~city engineer~~ public works department regarding flood hazard areas shall include, but not be limited to:

A. Permit Review.

1. Review all development permits to determine that the permit requirements of this chapter have been satisfied;

2. Review all development permits to determine that all necessary permits have been obtained from those federal, state or local governmental agencies from which prior approval is required;

3. Review all development permits to determine if the proposed development is located in the floodway. If located in the floodway, assure that the encroachment provisions of ACC 15.68160C are met.

B. Use of Other Base Flood Data. When base flood elevation data has not been provided in accordance with ACC 15.68.~~080~~060B, the city engineer shall obtain, review, and reasonably utilize any base flood elevation and floodway data available from a federal, state or other sources in order to administer ~~ACC 15.68.170(A) and 15.68.180~~ this chapter.

C. Information to Be Obtained and Maintained.

1. Where base flood elevation data has not otherwise been ~~is~~ provided ~~through the Flood Insurance Study or required as~~ in accordance with this chapter~~ACC 15.68.150B~~, obtain and record the actual elevation (in relation to mean sea level) of the lowest habitable floor (including basement) of all new or substantially improved structures, and whether or not the structure contains a basement; This information shall be recorded on a current FEMA Elevation Certificate (FEMA Form 81-31), signed and sealed by a professional land surveyor, currently licensed in the State of Washington.

2. For all new or substantially improved floodproofed structures:

(a) Verify and record the actual elevation (in relation to mean sea level), and

(b) Maintain the floodproofing certifications required in ~~ACC 15.68.1340 (A)(3)~~ this chapter.

3. Maintain for public inspection all records pertaining to the provisions of this chapter. This information shall be recorded on a current FEMA Floodproofing Certificate (FEMA Form 81-65), professional engineer, currently licensed in the State of Washington.

D. Alteration of Watercourses.

1. Notify adjacent communities and the Department of Ecology prior to any alteration or relocation of a watercourse, and submit evidence of such notification to the Federal Insurance Administration;

2. Require that maintenance is provided within the altered or relocated portion of said watercourse so that the flood-carrying capacity is not diminished. If the maintenance program does not call for cutting of native vegetation, the system shall be oversized at the time of construction to compensate for said vegetation growth or any other natural factor that may need future maintenance.

E. Interpretation of FIRM Boundaries. Make interpretations where needed as to exact location of the boundaries of the areas of special flood hazards (for example, where there appears to be a conflict between a mapped boundary and actual field conditions). The person contesting the location of the boundary shall be given a reasonable opportunity to appeal the interpretation.

F. Appeals of determinations made pursuant to this chapter shall be filed with the city's public works director within 20 working days after the final city engineer decision is issued. The public works director shall have 15 working days to review the appeal, determine whether to uphold of modify the city engineer's decision, and notify the applicant of such determination. The decision of the public works director shall be final. The city engineer's and director's decision shall be granted consistent with the standards of Section 60.6 of the Rules and Regulations of the National Flood Insurance Program (44 CFR 59-76). (Ord. 6182 § 4, 2008; Ord. 6161 § 1, 2008; Ord. 4820 § 1, 1995; Ord. 4357 § 2(4.3), 1989.)

15.68.151 Duties and responsibilities of the ~~city of Auburn building division~~ planning and development department.

Duties of the ~~city building divisions~~ planning and development department shall include, but not be limited to:

A. Permit Review.

1. Review all building-related development permits to determine that the permit requirements of this chapter have been satisfied including building, addition and alteration permits;

2. Review all building-related development permits to determine that all necessary permits have been obtained from those federal, state or local governmental agencies from which prior approval is required; and

3. Review all building-related projects to determine that the procedures for building projects within a special flood hazard area have been applied.

B. Information to be Obtained and Maintained.

1. Where base flood elevation data is provided through the Flood Insurance Study or required as in ACC 15.68.150(B) obtain and record the actual elevation (in relation to mean sea level) of the lowest floor (including basement) of all new or substantially improved structures, and whether or not the structure contains a basement;

2. For all new or substantially improved floodproofed structures:

(a) Verify and record the actual elevation (in relation to mean sea level); and

(b) Maintain the floodproofing certifications required in ~~ACC 15.68.130(A)~~ this chapter;

3. Maintain for public inspection all building-related records pertaining to the provisions of this chapter. (Ord. 6161 § 1, 2008.)

Article V. Provisions for Flood Hazard Protection

15.68.160 ~~General standards~~ Standards of the ~~city of auburn engineering division~~ public works department.

A. Utilities.

1. All new and replacement water supply systems shall be designed to minimize or eliminate infiltration of floodwaters into the system.

2. New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of floodwaters into the systems and discharge from the systems into floodwaters.

3. On-site waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding.

4. All new streets shall be designed to ensure the lowest finished surface elevation is a minimum of one foot higher than the adjacent 100-year flood elevation.

5. All new development shall be designed and located to minimize the impact on flood flows, flood storage, water quality, and habitat.

(a) Stormwater and drainage features shall incorporate low impact development techniques that mimic pre-development hydrologic conditions, such as

stormwater infiltration, rain gardens, grass swales, filter strips, disconnected impervious areas, permeable pavement, and vegetative roof systems.

(b). If the proposed project will create new impervious surfaces so that more than 10 percent of the portion of the lot in the Regulatory Floodplain is covered by impervious surface, the applicant shall demonstrate that there will be no net increase in the rate and volume of the stormwater surface runoff that leaves the site or that the adverse effect is mitigated as required in ACC 15.68.135(J) and ACC 15.68.135(K).

6. The site plan required in this chapter shall account for surface drainage to ensure that:

(a). Existing and new buildings on the site will be protected from stormwater runoff and

(b). The project will not divert or increase surface water runoff onto neighboring properties.

7. Utilities

Water wells shall be located outside the floodway and shall be protected to the FPE.

B. Subdivision Proposals.

1. All subdivision proposals shall be consistent with the need to minimize flood damage.

2. All subdivision proposals shall have public utilities and facilities such as sewer, gas, electrical, and water systems located and constructed to minimize flood damage.

3. All subdivision proposals shall have adequate drainage provided to reduce exposure to flood damage.

~~4. Where base flood elevation data has not been provided or is not available from another authoritative source, it shall be generated by the applicant and approved by the engineering division for subdivision proposals and other proposed developments which contain at least 50 lots or five acres (whichever is less).~~

C. Floodway Standards

1. In addition to the other requirements of this ordinance, a project to develop in the floodway as delineated pursuant to this Chapter shall meet the following criteria:

(a) The applicant shall provide a certification by a registered professional engineer demonstrating through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the proposed development would not result in any increase in flood levels during the occurrence of the base flood discharge.

(b) Construction or reconstruction of residential structures is prohibited within designated floodways, except for the following. The following exceptions must still meet all other requirements in the ordinance.

(i) Repairs, reconstruction, or improvements to a residential structure which do not increase the ground floor area, providing the cost of which does not exceed 50 percent of the market value of the structure either, (a) before the repair, or reconstruction is started, or (b) if the structure has been damaged, and is being restored, before the damage occurred. Any project for improvement of a structure to correct existing violations of State or local health, sanitary, or safety code specifications

which have been identified by a local code enforcement official and which are the minimum necessary to assure safe living conditions, or to an historic structure, may be excluded from the 50 percent calculations.

(ii) Repairs, replacement, reconstruction, or improvements to existing farmhouses located in designated floodways and located on designated agricultural lands that do not increase the building's total square footage of encroachment and are consistent with all requirements of WAC 173-158-075.

(iii) Repairs, replacement, reconstruction, or improvements to substantially damaged residential dwellings other than farmhouses that do not increase the building's total square footage of encroachment and are consistent with all requirements of WAC 173-158-076; or

(iv) Repairs, reconstruction, or improvements to residential structures identified as historic structures that do not increase the building's dimensions.

2. In riverine Special Flood Hazard Areas where a floodway has not been delineated pursuant to this chapter, the applicant for a project to develop in the SFHA shall provide a certification by a registered professional engineer demonstrating through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the proposed development and all other past or future similar developments would not cumulatively result in an increase of flood levels during the occurrence of the base flood discharge by more than one foot. (Ord. 6161 § 1, 2008; Ord. 4820 § 1, 1995; Ord. 4357 § 2(5.1), 1989.)

15.68.161 ~~General standards~~ Standards of the ~~city of Auburn building division~~ planning and development department.

In all areas of special flood hazard the following standards are required:

A. Anchoring.

1. All new construction and substantial improvements shall be anchored to prevent flotation, collapse or lateral movement of the structure.

2. All manufactured homes must likewise be anchored to prevent flotation, collapse or lateral movement, and shall be installed using methods and practices that minimize flood damage. Anchoring methods may include, but are not limited to, use of over-the-top or frame ties to ground anchors. This requirement is in addition to other anchoring requirements for resisting wind forces. (Reference FEMA's "Manufactured Home Installation in Flood Hazard Areas" guidebook for additional techniques.)

B. Construction Materials and Methods.

1. All new construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage.

2. All new construction and substantial improvements shall be constructed using methods and practices that minimize flood damage.

3. Electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities shall be designed and/or otherwise elevated or located so as to prevent water from entering or accumulating within the components during conditions of flooding.

C. Review of Building Permits. Where elevation data is not available either through the Flood Insurance Study or from another authoritative source ~~(ACC~~

~~15.68.150(B))~~, applications for building permits shall be reviewed to assure that proposed construction will be reasonably safe from flooding. The test of reasonableness is a local judgment and includes use of historical data, high water marks, photographs of past flooding, etc., where available. Failure to elevate at least two feet above grade in these zones may result in higher insurance rates.

D. Native Vegetation

The site plan required for development in the regulatory floodplain shall show existing native vegetation.

1. In the riparian habitat zone, native vegetation shall be left undisturbed, except if in connection with an activity allowed in the Regulatory Floodplain without a permit, and except for activities with the sole purpose of creating, restoring or enhancing natural functions associated with floodplains, streams, lakes, estuaries, marine areas, habitat, and riparian areas that meet Federal and State standards, provided the activities do not include structures, grading, fill, or impervious surfaces.

2. Outside the riparian habitat zone, removal of native vegetation shall not exceed 35 percent of the surface area of the portion of the site in the Regulatory Floodplain. Native vegetation in the riparian habitat zone portion of the property can be counted toward this requirement.

3. If the proposed project does not meet the criteria of this chapter, a habitat impact assessment shall be conducted pursuant to ACC 15.68.135K and, if indicated by that assessment, a habitat mitigation plan shall be prepared and implemented pursuant to ACC 15.68.135L. (Ord. 6161 § 1, 2008.)

15.68.170 ~~Specific~~ Additional standards of the ~~city of auburn building division~~ planning and development department.

In all areas of special flood hazard where base flood elevation data is provided as set forth in ~~ACC 15.68.080 or 15.68.150(B)~~this chapter, the following provisions are required:

A. Residential Construction.

1. New construction and substantial improvement of any residential structure shall have the lowest floor, including basement, elevated one foot or more above base flood elevation. Enclosed crawl space areas no taller than three feet, measured from the lowest ground within the crawl space to the bottom of the structural system directly supporting the floor slab or sheathing above, shall not be considered as a basement.

2. Fully enclosed areas below the lowest floor that are subject to flooding are prohibited, or shall be designed to automatically equalize hydrostatic and hydrodynamic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must either be certified by a registered professional engineer or architect or must meet or exceed the following minimum criteria:

(a) A minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding shall be provided;

(b) The bottom of all openings shall be no higher than one foot above grade;

(c) Openings may be equipped with screens, louvers, or other coverings or devices; provided, that they permit the automatic entry and exit of floodwaters.

3. The structure shall be aligned parallel with the direction of flood flows.

4. The structure shall be anchored to prevent flotation, collapse, or lateral movement of the structure.

5. All materials below the FPE shall be resistant to flood damage and firmly anchored to prevent flotation. Materials harmful to aquatic wildlife, such as creosote, are prohibited below the FPE.

6. Electrical, heating, ventilation, duct work, plumbing, and air-conditioning equipment and other service facilities shall be elevated above the FPE. Water, sewage, electrical, and other utility lines below the FPE shall be constructed so as to prevent water from entering or accumulating within them during conditions of flooding.

7. Fully enclosed areas below the lowest floor that are subject to flooding are prohibited; Provided, that those areas may be used only for parking, storage, or building access and only if they are designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement shall either be certified by a registered professional engineer or licensed architect or meet or exceed the following minimum criteria:

a. A minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding shall be provided.

b. The bottom of all openings shall be no higher than one foot above grade.

c. Openings may be equipped with screens, louvers, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters.

B. Nonresidential Construction. New construction and substantial improvement to any commercial, industrial or other nonresidential structure shall either have the lowest floor, including basement, elevated one foot or more above the level of the base flood elevation. ~~or,~~ As an alternative to elevation, a new or substantial improvement to a nonresidential structure and its ~~together with~~ attendant utility and sanitary facilities, may be dry floodproofed in A Zones. The project shall meet the following requirements:

1. Be floodproofed so that below one foot above the base flood level the structure is watertight with walls substantially impermeable to the passage of water;

2. Have structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy;

3. Be certified by a registered professional engineer or a registered professional architect that the design and methods of construction are in accordance with accepted standards of practice for meeting provisions of this subsection based on their development and/or review of the structural design, specifications and plans. Such certifications shall be provided to the official as set forth in ACC 15.68.150(C)(2);

4. Nonresidential structures that are elevated, not floodproofed, must meet the same standards for space below the lowest floor as described in subsection (A)(2) of this section;

5. Applicants floodproofing nonresidential buildings shall be notified that flood insurance premiums will be based on rates that are one foot below the floodproofed level (e.g., a building constructed to one foot above the base flood level will be rated as one foot below that level).

C. Manufactured Homes. All manufactured homes to be placed or substantially improved within zones A1-30, AH, and AE shall be elevated on a

permanent foundation such that the lowest floor of the manufactured home is one foot or more above the base flood elevation and be securely anchored to an adequately anchored foundation system.

D. Recreational Vehicles. Recreational vehicles placed on sites are required to either:

1. Be on the site for fewer than 180 consecutive days; or

2. Be fully licensed and ready for highway use, on wheels or jacking system, attached to the site only by quick disconnect type utilities and security devices, and have no permanently attached additions; or

3. Meet the requirements of subsection C of this section and the elevation and anchoring requirements for manufactured homes.

E. Hazardous Materials. No new development shall create a threat to public health, public safety, or water quality. Chemicals, explosives, gasoline, propane, buoyant materials, animal wastes, fertilizers, flammable liquids, pollutants, or other materials that are hazardous, toxic, or a threat to water quality are prohibited from the Regulatory Floodplain. This prohibition does not apply to small quantities of these materials kept for normal household use or to materials kept in approved containers above the FPE or in a dry floodproofed non-residential building.

F. Small Structures. A low cost building such as a detached garage, boathouse, pole barn, or storage shed, that is no larger than 500 square feet and is not used for human habitation may be exempt from the elevation requirement of this chapter, provided:

1. It is used only for parking or storage;

2. It is constructed and placed on the building site so as to offer minimum resistance to the flow of floodwaters;

3. It is anchored to prevent flotation which may result in damage to other structures;

4. All portions of the structure below the FPE must be constructed of flood-resistant materials;

5. Service utilities such as electrical and heating equipment meet the standards of this chapter;

6. It has openings to allow free flowage of water that meet the criteria of this chapter;

7. The project meets all the other requirements of this chapter.

G. Location of structures. Structures and other development shall be located to avoid flood damage.

1. If a lot has a buildable site out of the Regulatory Floodplain, all new structures shall be located in that area.

2. If a lot does not have a buildable site out of the Regulatory Floodplain, all new structures, pavement, and other development must be sited in the location that has the least impact on habitat by locating the structures as far from the water body as possible or placing the structures on the highest land on the lot.

H. Critical Facilities.

1. Construction of new critical facilities shall be, to the extent possible, located outside the limits of the Regulatory Floodplain.

2. Construction of new critical facilities shall be permissible if no feasible alternative site is available, provided

(a) Critical facilities shall have the lowest floor elevated three feet above the base flood elevation or to the height of the 500-year flood, whichever is higher. If there is no available data on the 500-year flood, the permit applicants shall develop the needed data in accordance with FEMA mapping guidelines.

(b) Access to and from the critical facility shall be protected to the elevation of the 500-year flood. (Ord. 6161 § 1, 2008; Ord. 4820 § 1, 1995; Ord. 4357 § 2(5.2), 1989.)

15.68.180 Floodways and Community Acknowledgement of FEMA Map Amendments.

~~Located within areas of special flood hazard established in ACC 15.68.080 are areas designated as floodways. Since the floodway is an extremely hazardous area due to the velocity of floodwaters which carry debris, potential projectiles and erosion potential, the following provisions apply:~~

~~A. Prohibit encroachments, including fill, new construction, substantial improvements, and other development, unless it has been demonstrated through hydrologic and hydraulic analysis performed in accordance with standard engineering practices with certification provided by a registered professional engineer that encroachments shall not result in any increase in flood levels during the occurrence of the base flood discharge;~~

~~B. Construction or reconstruction of residential structures is prohibited within designated floodways, except for (1) repairs, reconstruction, or improvements to a structure which do not increase the ground floor area; and (2) repairs, reconstruction or improvements to a structure, the cost of which does not exceed 50 percent of the assessed valuation of the structure as established by the most current King County or Pierce County assessor's tax roll, either (a) before the repair, reconstruction, or repair is started, or (b) if the structure has been damaged, and is being restored, before the damage occurred. Work done on structures to comply with existing health, sanitary, or safety codes or to structures identified as historic places shall not be included in the 50 percent;~~

~~C. If subsection A of this section is satisfied, all new construction and substantial improvements shall comply with all applicable flood hazard reduction provisions of this chapter;~~

~~D.~~ Notwithstanding any other provision of this chapter, the city may permit encroachments within the adopted regulatory floodway upon receipt of approval of the Federal Insurance Administrator and completion of the conditions of this section.

1. Prior to a developer being authorized to encroach upon the adopted regulatory floodway to an extent which will cause base flood elevation increases in excess of those permitted in subsection A of this section, the developer shall provide, for city review and submission to the Federal Insurance Administrator, the following:

a. A request for conditional approval of map change and the appropriate initial fee as specified by Section 72.3 of 44 CFR Ch. I Federal Emergency Management Agency or a request for exemption from fees as specified by Section 72.5

of 44 CFR Ch. I Federal Emergency Management Agency. Sections 72.3 and 72.5 of 44 CFR Ch. I Federal Emergency Management Agency are herein adopted by reference in their entirety including any future amendments thereto;

b. An evaluation of alternatives which would not result in a base flood elevation increase above that permitted under subsection A of this section demonstrating why these alternatives are not feasible;

c. Documentation of individual legal notice to all impacted property owners within and outside of the community, explaining the impact of the proposed action on their property;

d. Written concurrence of the chief executive officer of any other communities impacted by the proposed actions;

e. Written certification that no structures are located in areas which would be impacted by the increased base flood elevation;

f. A request for revision of base flood elevation determination according to the provisions of Section 65.6 of 44 CFR Ch. I Federal Emergency Management Agency. Section 65.6 of 44 CFR Ch. I Federal Emergency Management Agency is herein adopted by reference in its entirety;

g. A request for floodway revision in accordance with the provisions of Section 65.7 of 44 CFR Ch. I Federal Emergency Management Agency. Section 65.7 of 44 CFR Ch. I Federal Emergency Management Agency is herein adopted by reference in its entirety.

B. City review of changes to flood hazard data.

1. All requests to revise or change the flood hazard data, including requests for a Letter of Map Revision and a Conditional Letter of Map Revision shall be reviewed by the floodplain administrator.

(a). The floodplain administrator shall not sign the Community Acknowledgement Form for any requests based on filling or other development, unless the applicant for the letter documents that such filling or development is in compliance with this ordinance.

(b). The floodplain administrator shall not approve a request to revise or change a floodway delineation until FEMA has issued a Conditional Letter of Map Revision that approves the change.

(c) Upon receipt of the Federal Insurance Administrator's conditional approval of map change and prior to the approval of the proposed encroachments, the developer shall compensate the city for all costs incurred by the city which are associated with:

(1) The city's adoption of floodplain management ordinances incorporating the increased base flood elevations and/or revised floodway reflecting the post-project condition;

(2) The city's submittal of evidence to the Federal Insurance Administrator of the city's adoption of said revised floodplain management ordinances.

3. Within three months of completion of the proposed encroachments, the developer shall be responsible for providing certified record drawings and/or technical or scientific data to the city for submittal to the Federal Insurance Administrator.

2. If an applicant disagrees with the regulatory data prescribed by this ordinance, he/she may submit a detailed technical study needed to replace existing

data with better data in accordance with FEMA mapping guidelines or Regional Guidance for Hydrologic and Hydraulic Studies FEMA Region X, 2010. If the data in question are shown on the published FIRM, the submittal must also include a request to FEMA for a Conditional Letter of Map Revision.

3. All new hydrologic and hydraulic flood studies conducted pursuant to this chapter shall consider future conditions and the cumulative effects from anticipated future land use changes in accordance with Regional Guidance for Hydrologic and Hydraulic Studies, FEMA Region X, 2010. If there is an study in existence on the date this provision becomes effective that meets the rest of this chapter's criteria, it may be used, even if it does not account for future conditions. (Ord. 6161 § 1, 2008; Ord. 4820 § 1, 1995; Ord. 4357 § 2(5.3), 1989.)

15.68.190 Developments within areas of special flood hazard

Notwithstanding any other provision of this chapter, the city may permit developments within ~~areas of~~ special flood hazard areas. Prior to approval for a development which will increase the water surface elevation of the base flood by more than one foot, a developer must comply with the requirements set forth in ACC 15.68.180(~~D~~A). (Ord. 6161 § 1, 2008; Ord. 4820 § 1, 1995; Ord. 4357 § 2(5.4), 1989.)

15.68.200 Compensatory storage ~~equipment~~requirements.

A. Development proposals shall not reduce the effective ~~base~~ flood storage volume at base flood elevation. Where fill, grading or other activities that may displace the effective base flood storage volume are proposed, compensatory storage shall be required. Compensatory storage shall:

1. Provide equivalent volume at equivalent elevations to that being displaced;

2. Hydraulically connect to the source of the flooding;

3. Provide compensatory storage in the same construction season as when the displacement of flood storage volume occurs. Allowances may be granted on a case-by-case basis to allow sequential construction if the timing of the work cannot meet wintertime/flood construction schedules; and

4. Occur on site or, if approved by the city engineer, at a hydraulically connected off-site location.

5. Provide documentation of a restrictive easement acceptable to the engineering division to ensure continued existence of the compensatory flood storage.

6 The newly created storage area shall be graded and vegetated to allow fish access during flood events without creating fish stranding sites.

B. Certification by a registered professional engineer may be required as documentation that the compensatory storage requirement shall be met by the development proposal. (Ord. 6161 § 1, 2008.)

Section 3. Amendment to City Code. Section 16.10.010 of the Auburn City Code be and the same hereby is amended to read as follows:

16.10.010 Purpose and intent.

A. The city of Auburn contains numerous areas that can be identified and characterized as critical or environmentally sensitive. Such areas within the city include wetlands, streams, wildlife habitat, significant trees, geologic hazards, ground water protection areas, and flood hazards.

B. The city finds that these critical areas perform a variety of valuable and beneficial biological and physical functions that benefit the city and its residents. Alteration of certain critical areas may also pose a threat to public safety or to public and private property or the environment. The city therefore finds that identification, regulation and protection of critical areas are necessary to protect the public health, safety and general welfare. The city further finds that the functions of critical areas and the purpose of these regulations include the following:

1. Wetlands. Wetlands perform a variety of functions that include maintaining water quality; storing and conveying storm water and flood water; recharging ground water; providing important fish and wildlife habitat; and serve as areas for recreation, education and scientific study, and aesthetic appreciation.

Wetland buffers serve to moderate runoff volume and flow rates; reduce sediment, chemical nutrient and toxic pollutants; provide shading to maintain desirable water temperatures; provide habitat for wildlife; and protect wetland resources from harmful intrusion.

The primary goals of wetland regulation are to avoid adverse effects to wetlands ~~impacts~~; to achieve no net loss of wetland function and value – acreage may also be considered in achieving the overall goal; to provide levels of protection that reflect the sensitivity of individual wetlands and the intensity of proposed land uses; and to restore and/or enhance existing wetlands, where possible.

2. Streams. Streams and their associated riparian corridors provide important fish and wildlife habitat; help to maintain water quality; store and convey storm water and flood water; recharge ground water; and serve as areas for recreation, education and scientific study and aesthetic appreciation. Stream buffers serve to moderate runoff volume and flow rates; reduce sediment, chemical nutrient and toxic pollutants; provide shading to maintain desirable water temperatures; provide habitat for wildlife; and protect stream resources from harmful intrusion.

The primary goals of stream regulation are to avoid adverse effects ~~impacts~~ to streams and associated riparian corridors; to achieve no net loss of functions and values of the larger ecosystem in which the stream is located; to protect fish and wildlife resources; to protect water quality through appropriate management techniques; and, where possible, to provide for stream enhancement and rehabilitation.

3. Wildlife Habitat. Wildlife habitat provides opportunities for food, cover, nesting, breeding and movement for fish and wildlife; maintains and promotes diversity of species and habitat; coordinates habitat protection with elements of the open space system; helps to maintain air and water quality; helps control erosion; serves as areas for recreation, education, scientific study, and aesthetic appreciation; and provides neighborhood separation and visual diversity within urban areas.

The primary goals of wildlife habitat regulation are to avoid adverse effects ~~impacts~~ to critical habitats for fish and wildlife; to achieve no net loss of functions and

values of the larger ecosystem in which the wildlife habitat is located; to implement the goals of the Endangered Species Act; to promote connectivity between habitat areas to allow for wildlife movement; to provide multi-purpose open space corridors; and where possible to provide for fish and wildlife habitat enhancement and rehabilitation that reflect the sensitivity of the species.

4. Ground Water Protection Areas. Ground water protection areas provide a source of potable water and contribute to stream discharge/flow. Such areas contribute to the recharge of aquifers, springs and/or wells and are susceptible to contamination of water supplies through infiltration of pollutants through the soil.

The primary goals of ground water protection regulations are to protect ground water quality by maintaining the quantity of recharge; avoiding or limiting land use activities that pose potential risk of aquifer contamination; and to minimize or avoid adverse effects~~impacts~~ to ground water protection areas through the application of performance standards, and to comply with the requirements of the Federal Safe Drinking Water Act and Washington Administrative Code that require Group A public water systems to develop and implement a wellhead protection program.

5. Geologic Hazard Areas. Geologic hazard areas include lands or areas characterized by geologic, hydrologic and topographic conditions that render them susceptible to varying degrees of risk of landslides, erosion, seismic or volcanic activity.

The primary goals of regulating geologic hazards are to avoid and minimize potential impacts to life and property by regulating and/or limiting land uses where necessary, and to conduct appropriate levels of analysis and ensure sound engineering and construction practices to address identified hazards.

6. Flood Hazard Areas. Floodplains help to store and convey storm water and flood water; recharge ground water; provide important areas for riparian habitat; and serve as areas for recreation, education, and scientific study. Development within floodplain areas can be hazardous to those inhabiting such development, and to those living upstream and downstream. Floods also cause substantial damage to public and private property that results in significant costs to the public and individuals.

The primary goals of flood hazard regulations are to limit or condition development within the ~~100-year floodplain~~ Regulatory Floodplain to avoid substantial risk of damage to public and private property and that results in significant costs to the public and individuals; to avoid significant increases in peak storm water flows or loss of flood storage capacity; ~~and to implement the objectives of the Draft Mill Creek Flood Control Plan, if and when adopted~~ to protect critical habitat for fish and wildlife, and to meet the purposes set forth in Chapter 15.68 of the Auburn City Code. Requirements for the identification, assessment, alteration, and mitigation of flood hazard areas are contained in Chapter 15.68 ACC.

C. This chapter of the Auburn City Code and other sections as incorporated by reference contain standards, procedures, criteria and requirements intended to identify, analyze, and mitigate potential impacts to the city's critical areas, and to enhance and restore degraded resources where possible. The general intent of these regulations is to avoid impacts to critical areas. In appropriate circumstances, impacts to specified critical areas resulting from regulated activities may be minimized, rectified, reduced and/or compensated for, consistent with the requirements of this chapter.

D. It is the further intent of this chapter to:

1. Comply with the requirements of the Growth Management Act (Chapter 36.70A RCW) and implement rules to identify and protect critical areas and to perform the review of development regulations required by RCW 36.70A.215;

2. Develop and implement a comprehensive, balanced and fair regulatory program that avoids impacts to critical resources where possible, that requires that mitigation be performed by those affecting critical areas, and that thereby protects the public from injury, loss of life, property or financial losses due to flooding, erosion, landslide, seismic events, soil subsidence, or steep slope failure;

3. Implement the goals and policies of the Auburn comprehensive plan, including those pertaining to natural features and environmental protection, as well as goals relating to land use, housing, economic development, transportation, and adequate public facilities;

4. Serve as a basis for exercise of the city's substantive authority under the State Environmental Policy Act (SEPA) and the city's environmental review procedures, where necessary to supplement these regulations, while also reducing the city's reliance on project-level SEPA review;

5. Provide consistent standards, criteria and procedures that will enable the city to effectively manage and protect critical areas while accommodating the rights of property owners to use their property in a reasonable manner;

6. Provide greater certainty to property owners regarding uses and activities that are permitted, prohibited, and/or regulated due to the presence of critical areas;

7. Coordinate environmental review and permitting of proposals involving critical areas with existing development review and approval processes to avoid duplication and delay pursuant to the Regulatory Reform Act, Chapter 36.70B RCW;

8. Establish conservation and protection measures for threatened and endangered fish species in compliance with the requirements of the Endangered Species Act and the Growth Management Act requirements to preserve or enhance anadromous fisheries, WAC 365-195-925;

9. Alert members of the public, including appraisers, assessors, owners, potential buyers or lessees, to the development limitations of critical areas and their required buffers.

E. Best Available Science. The city has considered and included the best available science in developing these regulations, consistent with RCW 36.70A.172 and WAC 365-195-900, et seq. This has been achieved through research and identification of relevant technical sources of information, consultation with experts in the disciplines covered by this chapter, and consultation and requests for technical information regarding best available science from state and federal resource agencies.

Preparation of this chapter has included the use of relevant nonscientific information, including consideration of legal, social, policy, economic, and land use issues. This reflects the city's responsibilities under numerous laws and programs, including other provisions of the Growth Management Act, and the need to weigh and balance various factors as part of decision making to accomplish municipal objectives. This may result in some risk to the functions and values of some critical areas. The city will also use its authority under the State Environmental Policy Act (SEPA) to identify,

consider and mitigate, where appropriate, significant adverse effects on critical resources not otherwise addressed by the regulations of this chapter.

The city intends to review and monitor implementation of its critical areas regulations and to use an adaptive management approach. It will make adjustments to the regulations, as appropriate, in response to changing conditions, new information about best available science, or empirical data indicating the effectiveness of its regulatory program. This will occur in the context of the city's ongoing review and revision of its comprehensive plan and development regulations pursuant to the Growth Management Act.

Additional information, both scientific and nonscientific, regarding compliance with WAC 365-195-915(c), including identification of risks to resources, is contained in the findings and conclusions and the overall record supporting adoption of Auburn's critical areas regulations. (Ord. 5894 § 1, 2005.)

Section 4. Amendment to City Code. Section 16.10.070 of the Auburn City Code be and the same hereby is amended to read as follows:

16.10.070 Critical area review process and application requirements.

A. Pre-Application Conference. A pre-application conference is available and encouraged prior to submitting an application for a project permit.

B. Application Requirements.

1. Timing of Submittals. Concurrent with submittal of a State Environmental Policy Act (SEPA) checklist, or concurrent with submittal of an application for projects exempt from SEPA, a critical area report must be submitted to the city for review when the city believes that a critical area may be present. The purpose of the report is to determine the extent, characteristics and functions of any critical areas located on or potentially affected by activities on a site where regulated activities are proposed. The report will also be used by the city to determine the appropriate critical area classification and, if applicable, to establish appropriate buffer requirements.

2. Report Contents. Reports and studies required to be submitted by this chapter shall contain, at a minimum, the information indicated in the provisions of this chapter applicable to each critical area. The director may tailor the information required to reflect the complexity of the proposal and the sensitivity of critical areas that may potentially be present.

C. Consultant Qualifications and City Review. All reports and studies required of the applicant by this section shall be prepared by a qualified consultant as that term is defined in these regulations. The city may retain a qualified consultant paid for by the applicant to review and confirm the applicant's reports, studies and plans if the following circumstances exist:

1. The city has technical information that is unavailable to the applicant; or

2. The applicant has provided inaccurate or incomplete information on previous proposals or proposals currently under consideration.

D. Review Process. This section is not intended to create a separate critical area review permit for development proposals. To the extent possible, the city shall

consolidate and integrate the review and processing of critical area-related aspects of proposals with other land use and environmental considerations and approvals. Any permits required by separate codes or regulations, such as flood plain development ~~zone control~~ permits or shoreline substantial development permits, shall continue to be required. (Ord. 5894 § 1, 2005.)

Section 5. Amendment to City Code. Section 17.04.300 of the Auburn City Code be and the same hereby is amended to read as follows:

17.04.300 Regulatory floodway.

"Regulatory floodway" means ~~the channel of a river or other water course and the adjacent land areas which must be reserved in order to discharge a flood without cumulatively increasing the water surface elevation by more than one foot, as indicated on the applicable Flood Insurance Rate Map (FIRM) map.~~the channel of a stream or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot at any point.

Section 6. Amendment to City Code. Section 17.09.050 of the Auburn City Code be and the same hereby is amended to read as follows:

17.09.050 Development requirements.

A. Lot Area and Dimensions. Each lot created by short subdivision shall contain sufficient square footage and lot dimensions to meet the requirements of ACC Title 18. Each lot to be served by an on-site sewage disposal system shall be a minimum of 15,000 square feet in area and shall also meet the minimum lot area requirements of the county department of health rules and regulations. Land contained in access easements, tracts or panhandles shall not be included in lot area or lot dimension calculations for the purposes of this section.

B. Every lot within a short subdivision shall be capable of being reasonably served by public or private sewage disposal, water, storm drainage facilities and streets. The city will not approve a short subdivision for which a building permit cannot be issued because of insufficient infrastructure.

C. Conformance with Adopted Plans. Street, water, sewer and storm drainage facilities adjacent to or within the short subdivision shall be in conformance with adopted city ordinances, standards and policies. Easements for utilities recommended by such plans shall be provided to the city, with the exact location of such easements to be determined by the city engineer.

D. Floods, Flood Control and Storm Drainage.

1. Where any portion of the proposed short subdivision lies within an area of special flood hazard or regulatory floodway, conformance with adopted city flood hazard area ordinances, standards and policies shall be required.

2. A conceptual storm drainage/site grading plan shall be required to be submitted, as part of the short subdivision application, unless waived by the city engineer.

3. The proposed subdivision should have one or more new lots in the Regulatory Floodplain set aside for open space use through deed restriction, easement, subdivision covenant, or donation to a public agency. The density of the development in the portion of the development outside the Regulatory Floodplain may be increased in accordance with applicable land use and subdivision regulations.

4. If a parcel has a buildable site outside the Regulatory Floodplain, it shall not be subdivided to create a new lot, tract, or parcel within a binding site plan that does not have a buildable site outside the Regulatory Floodplain. This provision does not apply to lots set aside from development and preserved as open space.

E. Adjacent Streets. When any public street lying adjacent to the property being short subdivided has insufficient width or for any other reason does not conform to minimum street standards, in accordance with the city design and construction standards, sufficient additional right-of-way shall be dedicated to the city and appropriate improvements shall be made by the subdivider to conform the abutting half of the street to such standards consistent with Chapter 12.64A ACC. Deferral of such improvement requirements shall be in conformance with the city of Auburn design and construction standards.

F. Access.

1. All short subdivisions shall border on an opened, constructed and maintained public street. All lots within a short subdivision shall either border on an opened, constructed and maintained public street or shall be served by a private street, access easement, tract or panhandle having direct access to such a public street. Where private streets and access easements are provided, they shall be improved or guaranteed to the city of Auburn and be in conformance with the city of Auburn design and construction standards.

2. All private streets, access easements and panhandles shall be capable of meeting the fire access requirements of Chapter 15.36A ACC and the development standards of Chapters 17.14 and 18.31 ACC, in addition to any other requirements of this title, including, but not limited to, an adequate surface for access and minimum turnaround requirements on dead-end streets or access easements as specified by the fire department.

3. All proposals shall ensure that all buildable lots shall have at least one access road connected to land outside the Regulatory Floodplain with the surface of the road at or above the FPE.

G. Dedication of Streets. Dedication of a public street or streets may be required, whenever the city engineer finds that one or more of the following conditions applies:

1. The general alignment of a proposed private street, access easement or panhandle follows the general alignment of a future arterial as shown in the comprehensive plan; or

2. The general alignment of a proposed private street, access easement or panhandle can be reasonably modified to provide a desirable through-connection between two or more existing or planned public streets or arterials; or

3. A public street would be necessary to provide adequate access to adjacent property not subject to the proposed short subdivision.

H. Fire Hydrants. All lots within a short subdivision shall be capable of being served by a fire hydrant as required by Chapter 13.16 ACC. Property zoned RC, residential conservancy, may be exempt, provided the requirements of ACC 13.16.030 are met.

I. The final recorded subdivision plat shall include a notice that part of the property is in the SFHA, riparian habitat zone and/or channel migration area, as appropriate.

(Ord. 6239 § 1, 2009; Ord. 6186 § 12, 2008; Ord. 6006 § 3, 2006. Formerly 17.14.055)

Section 7. Amendment to City Code. Section 17.14.110 of the Auburn City Code be and the same hereby is amended to read as follows:

17.14.110 Floods and flood control.

The city may disapprove a proposed subdivision because of flood, inundation or swamp condition if the city finds that such condition poses a threat to the public health, safety or general welfare or causes a public nuisance.

Where any portion of the proposed subdivision lies within the ~~area of special flood hazard or the floodway~~ Regulatory Floodplain, the hearing examiner shall impose a condition on the preliminary plat requiring the subdivider to conform to the city's ~~flood hazard area~~ Floodplain Development requirements as set forth in Chapter 15.68 of the Auburn City Code. In such cases, no development permit associated with the proposed subdivision shall be issued by the city until said flood hazard area regulations have been met.

The city may require dedication of land to any public body and/or the construction of improvements and may impose other conditions necessary to protect against flooding or inundation.

Section 8. New Section to City Code. Section 17.04.305 of the Auburn City Code be and the same hereby is created to read as follows:

17.04.305 Regulatory Floodplain.

"Regulatory Floodplain" means the area of the Special Flood Hazard Area and all Protected Areas within the City of Auburn. It also includes newly designated Special Flood Hazard Areas and Protected Areas that are delineated pursuant to City Ordinance.

Section 9. New Section to City Code. Section 17.04.335 of the Auburn City Code be and the same hereby is created to read as follows:

17.04.335 Special Flood Hazard Area.

"Special Flood Hazard Area (SFHA)" means the land subject to inundation by the base flood. Special Flood Hazard Areas are identified by the Federal Emergency Management Agency in the scientific and engineering reports entitled "Flood Insurance Study for King County, Washington and Incorporated Areas" dated April 19, 2005, and any revisions thereto, and "Flood Insurance Study for Pierce County, Washington and Unincorporated Areas" dated August 19, 1987, and any revisions thereto, and designated on associated Flood Insurance Rate Maps with the letters "A" including AE, AO, AH, A1-99.

Section 10. New Section to City Code. A New Section 18.70.025 of the Auburn City Code be and the same hereby is created to read as follows:

18.70.025 Variances in Regulatory Floodplains

A. Subject to conditions, safeguards and procedures provided by this section, the hearing examiner may be empowered to hear and decide applications for variances from the terms of Chapter 15.68; provided the hearing examiner may approve a variance only if the request conforms to all of the criteria in ACC 18.70.025.B. In reviewing applications for a variance, the Hearing Examiner shall consider all technical evaluations, all relevant factors, standards specified in other sections of this ordinance, and:

1. The danger to life and property due to flooding or erosion damage;
2. The danger that materials may be swept onto other lands to the injury of others;
3. The safety of access to the property in times of flood for ordinary and emergency vehicles;
4. The expected heights, velocity, duration, rate of rise, and sediment transport of the flood waters and the effects of wave action, if applicable, expected at the site;
5. The susceptibility of the proposed facility and its contents to flood or erosion damage and the effect of such damage on the individual owner;
6. The availability of alternative locations for the proposed use which are not subject to flooding or channel migration and are not in designated fish and wildlife habitat conservation areas;
7. The relationship of the proposed use to the comprehensive plan, growth management regulations, and floodplain management program for that area;

8. The costs of providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities such as sewer, gas, electrical, and water systems, and streets and bridges;

9. The potential of the proposed development project to destroy or adversely affect~~modify~~ a fish and wildlife habitat conservation area; and

10. The potential of the proposed development project to affect, or be affected by, channel migration; and

11. Shall not result in a violation of this ordinance.

12. Must be compliant with the Endangered Species Act.

B. The examiner must enter findings of fact and conclusions of law which support the following criteria and any conditions. No variance shall be granted to the requirements of Chapter 15.68 ACC unless the applicant demonstrates that:

1. The development project cannot be located outside the Regulatory Floodplain;

2. An exceptional hardship would result if the variance were not granted;

3. The relief requested is the minimum necessary;

4. The applicant's circumstances are unique and do not represent a problem faced by other area properties;

5. If the project is within a designated floodway, no increase in flood levels during the base flood discharge would result;

6. The project will not adversely affect fish or other wildlife habitat;

If the issue is not specific to the property, but is a problem faced by other properties, the remedy should be a revision to the ordinance rather than a variance.

7. There will be no additional threat to public health, safety, beneficial stream or water uses and functions, or creation of a nuisance;

8. There will be no additional public expense for flood protection, lost environmental functions, rescue or relief operations, policing, or repairs to streambeds, shorelines, banks, roads, utilities, or other public facilities; and

9. All requirements of other permitting agencies will still be met.

C. Variances requested in connection with restoration of a historic site, building or structure may be granted using criteria more permissive than the above requirements, provided:

1. The repair or rehabilitation is the minimum necessary to preserve the historic character and design of the site, building or structure; and

2. The repair or rehabilitation will not result in the site, building or structure losing its historic designation.

D. Variances to the provisions of ACC 15.68.161 and 15.68.170 may be issued for a structure on a small or irregularly shaped lot contiguous to and surrounded by lots with existing structures constructed below the FPE, providing the other variance criteria are met. The applicant for such a variance shall be notified, in writing, that the structure (i) will be subject to increased premium rates for flood insurance up to amounts as high as $25 for $100 of insurance coverage and (ii) such construction below the FPE increases risks to life and property. Such notification shall be maintained with a record of all variance actions.

E. Variances pertain to a physical piece of property. They are not personal in nature and are not based on the inhabitants or their health, economic, or financial circumstances.

Section 11. Repeal of Section of City Code. Section 17.04.045 of the Auburn City Code (Definitions - Area of special flood hazard.) is repealed in its entirety.

TEXT OF REPEALED SECTION

17.04.045 Area of special flood hazard.

"Area of special flood hazard" means the land within the floodplain in a community subject to a one percent or greater chance of flooding in any given year, as indicated in the Flood Insurance Rate Map (FIRM) program entitled Flood Boundary and Floodway Map. (Ord. 6239 § 1, 2009.)

Section 12. Incorporation of Guidelines. The "Floodplain Habitat Assessment and Mitigation Regional Guidance", developed by the Federal Emergency Management Agency drafted and dated January 2010, and any subsequent amendments or versions promulgated by the Federal Emergency Management Agency, and the "Regional Guidance for Hydrologic and Hydraulic Studies, developed by the Federal Emergency Management Agency drafted and dated January 2010, and any subsequent amendments or versions promulgated by the Federal Emergency Management Agency shall be on file with the City Clerk, and incorporated herein by this reference, for use in connection herewith.

Section 13. Ministerial Corrections. The Code Reviser is authorized and directed to change all references to "Flood Control Zone Permits" in the Auburn City Code to "Floodplain Development Permit."

Section 14. Repeal of Moratorium. The moratorium on the filing, receipt, and approval of applications for development in the floodplain created by Resolution

4416 and extended by Resolutions 4442, 4476, and 4535 is hereby terminated as of the effective date of this Ordinance.

Section 15. Fee schedule. The City of Auburn Fee Schedule shall be amended to include the following fees:

Planning Department Fees

Floodplain development permit (when other City of Auburn development permits required) $0

Floodplain development permit (stand alone permit; no other City of Auburn development permits required) $50.00

Habitat Impact Assessment Report Review Fee (stand alone submittal)... $250.00

Habitat Mitigation Plan Review Fee (stand alone submittal) $250.00

Combined Habitat Impact Assessment /Mitigation Plan Review Fee..... $500.00

and shall be further amended to delete the following fee:

Public Works Department Fees

6. Flood Control Zone Permit: *(Per Ordinance No. 5819)*

Base permit fee..... $50.00

The City Clerk is authorized to insert amend the City of Auburn Fee Schedule consistent with this section without any further action by the City Council.

Section 16. Implementation. The Mayor is hereby authorized to implement such administrative procedures as may be necessary to carry out the directions of this legislation. This authority specifically includes making non-substantive changes to the municipal code sections amended in this ordinance in order to comply with the direction of the federal agencies reviewing this ordinance. Department staff shall notify applicants

in writing that their permit application is being reviewed and, if appropriate, approved under interim regulations that are subject to final approval by the Federal Agencies. Therefore, any approved permit conditions may be modified by the City based on direction to do so by the Federal agencies.

Section 17. Severability. The provisions of this Ordinance are declared to be separate and severable. The invalidity of any clause, sentence, paragraph, subdivision, section or portion of this ordinance, or the invalidity of the application thereof to any person or circumstance shall not affect the validity of the remainder of this ordinance, or the validity of its application to other persons or circumstances.

Section 18. Effective date. This Ordinance shall take effect and be in force as interim regulations five days from and after its passage, approval and publication as provided by law. If the City receives approval of the ordinance from the federal agencies, provisions herein shall automatically be effective as permanent regulations, with the effective date the same as the effective date of the interim regulations.

INTRODUCED: _____

PASSED: _____

APPROVED: _____

CITY OF AUBURN

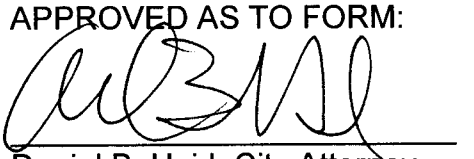
_____

PETER B. LEWIS
MAYOR

ATTEST:

_____
Danielle E. Daskam, City Clerk

APPROVED AS TO FORM:

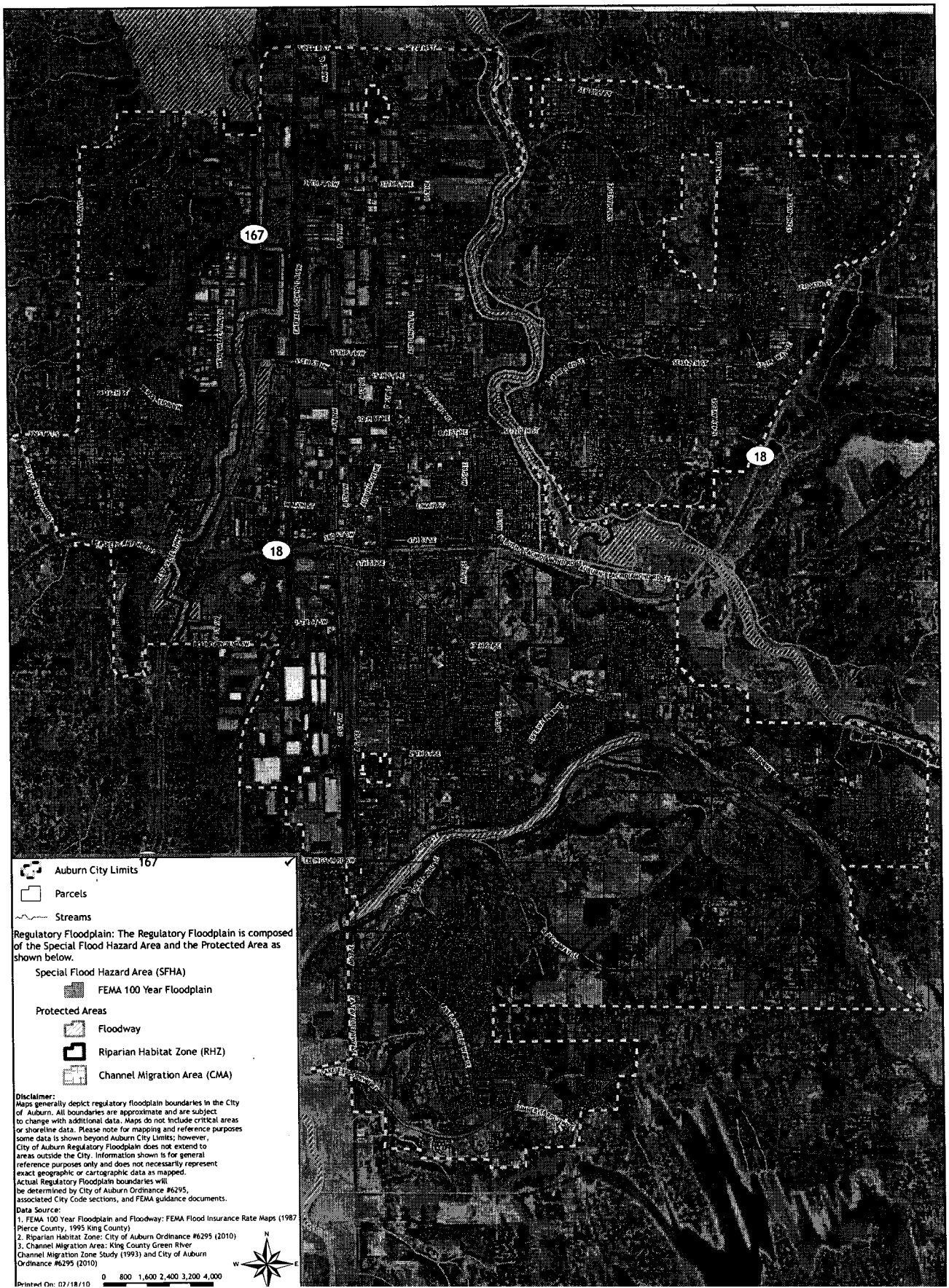


Daniel B. Heid, City Attorney

Published: _____

Draft

City of Auburn
Regulatory Floodplain



Floodplain Habitat Assessment and Mitigation

Regional Guidance

2010

FEMA Region 10

Regional Guidance

for

Floodplain Habitat Assessment and Mitigation

Produced by FEMA - Region 10
January 2010

FEMA
Region 10

For additional information or copies of this guidance:
Federal Emergency Management Agency
Attn: Mitigation Division
Federal Regional Center, Region 10
130 228th St. SW
Bothell, WA 98021-9796
(425) 487-4600
www.fema.gov/regionx/nfipesa.shtm

Contents

Acknowledgements

This guidance document was developed by Region X of the Federal Emergency Management Agency, as part of its continuing effort to improve floodplain management practices and assist communities in meeting the requirements of the Endangered Species Act.

It was prepared with the advice and assistance of a special advisory committee that included representatives from:

- City of Auburn
- City of Carnation
- City of Everett
- Island County
- Jefferson County
- King County
- City of Lacey
- Lummi Nation
- City of Monroe
- Pierce County
- San Juan County
- Snohomish County
- City of Tukwila
- Washington State Department of Ecology
- Whatcom County
- The National Marine Fisheries Service

This document was drafted by French & Associates, Ltd., Steilacoom, ESA Adolfson, Seattle, and PBS&J, Seattle, through an arrangement with the Insurance Services Office and the Community Rating System.

Introduction

Background

This Regional Guidance is written for communities in the Puget Sound Basin. It will assist them in meeting the requirements and criteria of the Endangered Species Act (ESA) as clarified in the Biological Opinion issued by the National Marine Fisheries Service (NMFS) on September 22, 2008. This Regional Guidance is intended for environmental planners, wildlife, floodplain, stream, and wetland scientists, and other qualified habitat professionals.

This document is designed to support the NFIP-ESA Model Ordinance, which was also prepared by FEMA Region X. The Model Ordinance includes a Biological Opinion Checklist which provides a summary of what is required of communities by the Endangered Species Act. For further details on the Biological Opinion's requirements, see the Model Ordinance *Introduction* section and the Biological Opinion text in Appendix E of the Model Ordinance.

Communities have the option of adopting the Model Ordinance or ensuring that their existing regulations fulfill all the Biological Opinion's requirements. Sections in the Model Ordinance are referenced in this guidance to help the reader match the requirements with the Biological Opinion and NFIP regulations. Additional references included in this assessment are listed at the end of the document.

This guidance was prepared with technical input from local officials, engineers, natural resources scientists, and planners. It is designed to assist qualified habitat professionals, representing both permit applicants and permit officials to ensure that new development will not adversely affect the habitat of protected threatened and endangered species in floodprone areas, including those areas associated with stream, lake, and marine water bodies.

Although the Biological Opinion addresses ESA listed salmonid species and Southern Resident killer whales, the Model Ordinance and this guidance were developed to address potential impacts to all ESA listed species.

Definitions

Four terms are used in this guidance and the Model Ordinance that may not be the same terms used in a community's regulations: "Regulatory Floodplain", "Special Flood Hazard Area" (or "SFHA"), "Protected Area," and "development." These terms are introduced in the Definitions section of the Model Ordinance (Section 2). The first three are defined in more detail in Sections 3.1, 3.2 and 3.4 of the Model Ordinance.

The Regulatory Floodplain is comprised of the SFHA and the Protected Areas, where:

- The SFHA is the area subject to flooding by the base flood (as determined and mapped for each community by FEMA within flood insurance studies and accompanying Flood Insurance Rate Maps (FIRMs)); and

- The Protected Area is comprised of those lands that lie within the boundaries of the floodway, the riparian habitat zone, and the channel migration area.

An example of how the Regulatory Floodplain, SFHA, and Protected Area interrelate is shown on the next page. A community's ordinance may use a different term to delineate the same or a larger area in order to reach the same objective of addressing adverse effects to aquatic and riparian habitat in the most sensitive areas. However, as these terms are used throughout this guidance, please refer to the full definitions included in Sections 2 and 3 of the Model Ordinance in order to ensure full consistency with the Biological Opinion.

A fourth term is also used throughout this document. In Section 2, the Model Ordinance defines "development" as

> any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations, storage of equipment or materials, subdivision of land, removal of more than 5% of the native vegetation on the property, or alteration of natural site characteristics.

When to Conduct a Habitat Assessment

Whenever a development project is proposed in the Regulatory Floodplain, the property owner must obtain a floodplain development permit from the community (Section 4.1). Certain types of projects can be permitted relatively quickly (see "Allowed Activities" on page 4). Applicants for projects that are not listed as exempt from conducting a habitat assessment by the community's floodplain management ordinance must assess the impact of the proposed development on flooding and habitat.

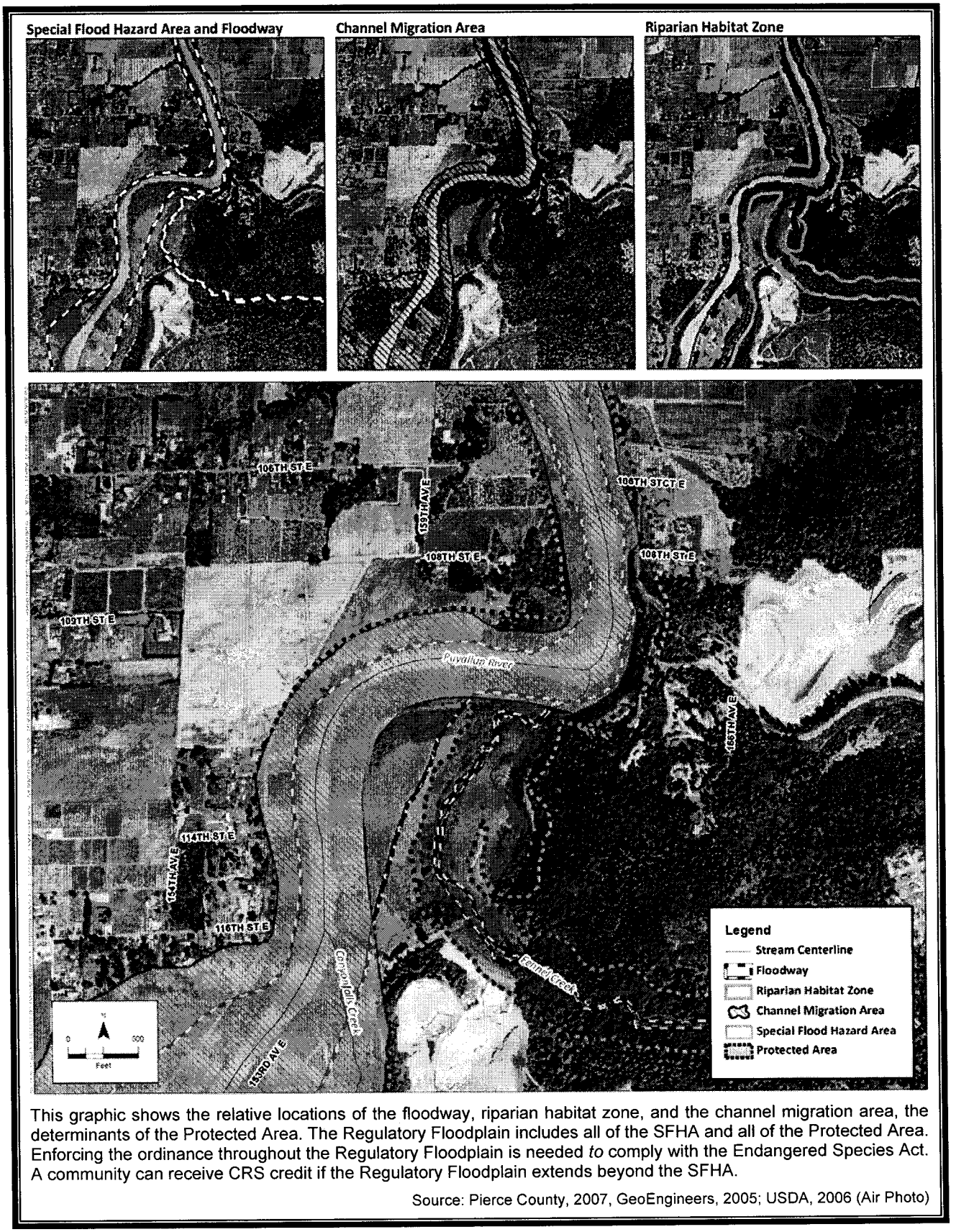
An adverse impact on flooding is prevented through the ordinance requirements for a floodway or encroachment analysis (Section 7.5) and compensatory storage (Section 7.6).

The impact of a project on habitat is more complicated because there is often little or no information on the site's natural features and different projects will have different impacts. Therefore a habitat assessment is needed to identify those features and determine how the proposed project will affect them (Section 7.7 in the Model Ordinance).

There are only two circumstances where a habitat assessment would not be required:

1. Projects that are listed as exempt from conducting a habitat assessment in the community's floodplain management ordinance; and
2. Projects that have undergone Section 7 consultation under the Endangered Species Act (ESA) in order to obtain a federal permit.

It should be noted that projects requiring a federal permit under Section 404 of the Clean Water Act would likely need a consultation process through the U.S. Army Corps of Engineers Regulatory Branch. The Section 404 permit process includes consultation with the US Fish and Wildlife Service (USFWS), and/or NMFS. Such consultation is required as required under Section 7 of the ESA.



This graphic shows the relative locations of the floodway, riparian habitat zone, and the channel migration area, the determinants of the Protected Area. The Regulatory Floodplain includes all of the SFHA and all of the Protected Area. Enforcing the ordinance throughout the Regulatory Floodplain is needed *to* comply with the Endangered Species Act. A community can receive CRS credit if the Regulatory Floodplain extends beyond the SFHA.

Source: Pierce County, 2007, GeoEngineers, 2005; USDA, 2006 (Air Photo)

If a permit applicant has prepared a Biological Evaluation or a Biological Assessment and has received concurrence from USFWS or NMFS, the project is deemed to comply with the ESA. In such cases, the additional habitat assessment requirements of this guidance are not required (see Section 7.7.A of the Model Ordinance).

Once it is determined that a habitat assessment is needed, a step by step assessment process is recommended in this guidance. This process is summarized in the flow chart on the following page. Steps 1 – 4 comprise the basic habitat assessment.

If the assessment finds an adverse effect, then the permit applicant must prepare a plan that identifies steps the permit applicant will take to mitigate that impact (Section 7.8 in the Model Ordinance and Steps 5 – 6 in this document) and must implement the mitigation plan.

It is recommended that applicants start with conceptual development plans and conduct a preliminary impact assessment before they invest in detailed project plans and specifications. Continued communication with community staff will also help identify problems and solutions before too much time and/or money is spent on a project that may require additional mitigation measures.

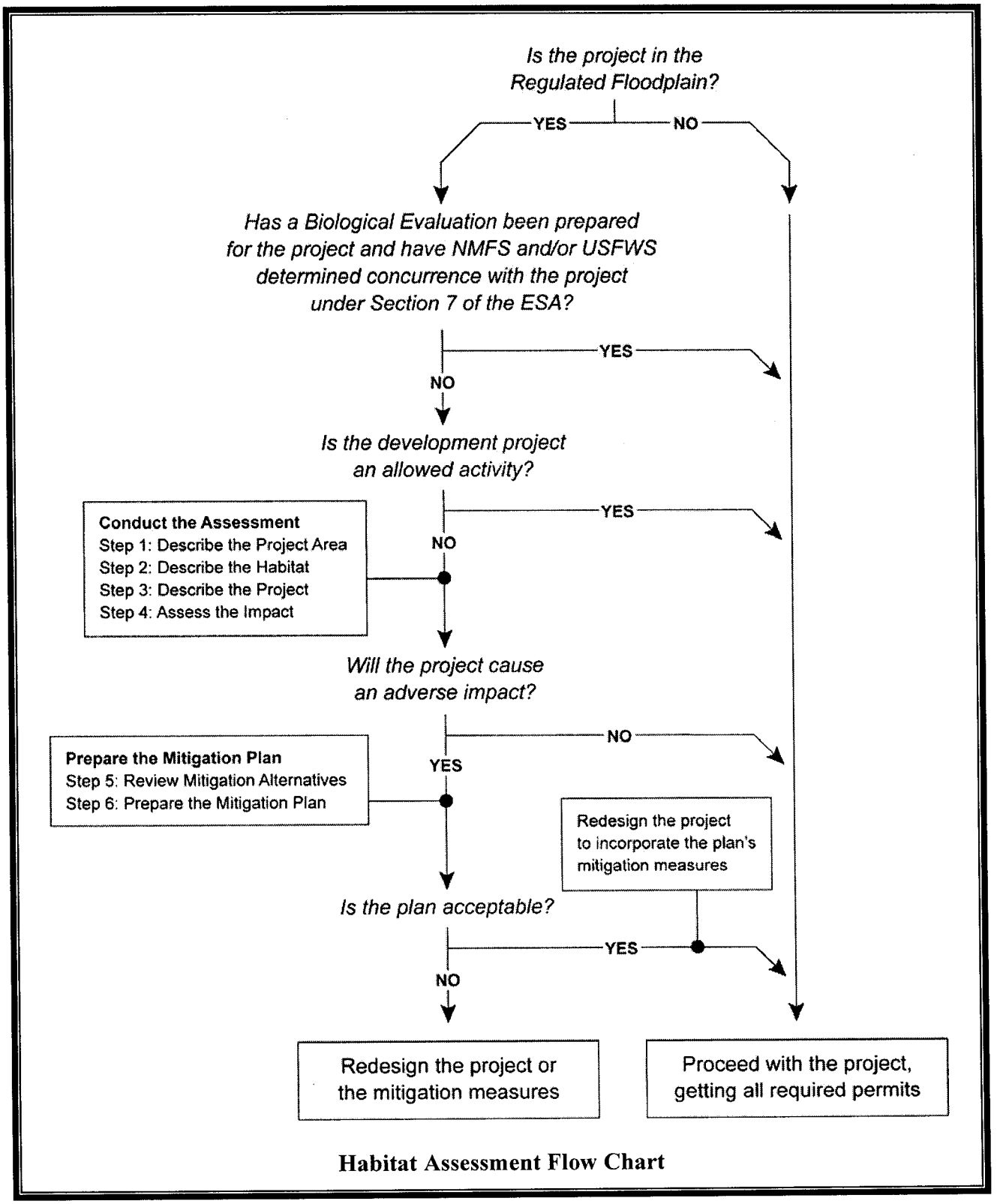
A permit applicant should weigh the cost of preparing the assessment and the mitigation plan, should one be needed, against the cost of locating the project outside the Regulatory Floodplain. It may cost less in time and money to simply avoid the SFHA and the Protected Area.

Allowed Activities

A habitat assessment is not needed if it is not required for certain activities, as specified by the community's floodplain management ordinance. The Model Ordinance, in Sections 7.1 and 7.2, identifies two types of activities that can proceed without the habitat assessment. The reader must check the community's flood management ordinance because it may have a slightly different list.

Section 7.1 of the Model Ordinance clarifies that some activities are not considered "development" and therefore do not need a floodplain development permit, provided all other State and local requirements are met. An example would be normal maintenance of structures, such as re-roofing and replacing siding (provided they are not part of a larger project that would need a permit). The Model Ordinance's list is not included here, because the community's list may be different.

Section 7.2 of the Model Ordinance lists other activities which are allowed in the Regulatory Floodplain without the floodway analysis or the habitat impact assessment required under Sections 7.5 and 7.7, providing they meet all the community's other requirements and a floodplain development permit is issued. Again, the Model Ordinance's list is not included here, because the community's list may be different and takes precedence.



Habitat Assessment Flow Chart

Conducting the Assessment

The following steps should be taken to adequately identify and address the impacts a proposed project may have on habitat within the Regulatory Floodplain. In circumstances where an approved habitat assessment (Steps 1 through 4) determines that no impacts to habitats associated with ESA listed species will occur, development of a mitigation plan is not necessary. However, for any activity requiring a habitat assessment within the Regulatory Floodplain, it is highly likely that impacts to habitats associated with ESA listed species will occur. When habitat impacts are identified, a mitigation plan must be prepared for the project, in accordance with Steps 5 and 6.

Step 1. Describe the Project Area

The project area is generally the parcel being developed. In some cases, the project may extend to a larger area, such as when a road to the parcel is to be built or improved. Step 1 should produce two documents:

1.1. Project Area Description

If a Washington State Joint Aquatic Resources Permit Application (JARPA) form has been prepared for the project, it will include all the project area description information needed for the habitat assessment. The Washington State JARPA form template can be found at: www.nws.usace.army.mil/PublicMenu/Menu.cfm?sitename=REG&pagename=Home_Page

If the information is already being provided in a Washington State JARPA, the community may accept the application form as sufficient for the project area description. If a Washington State JARPA has not been prepared for the project, the project area description should include the following information:

- Location information:
  - Street address
  - City and County
  - Township, section, and range
  - Latitude and longitude
  - Tax parcel number(s) of the project location
  - Type of ownership of the project (Federal, State, or locally owned public lands; tribal lands; privately owned lands)
- Water resource information:
  - Watershed name
  - Water resource inventory area (WRIA). Information on Puget Sound basin WRIAs can be found at the Washington State Department of Ecology's watershed planning webpage (http://www.ecy.wa.gov/watershed/index.html) and mapping webpage (http://www.ecy.wa.gov/services/gis/maps/wria/wria.htm)

- Water bodies in which work will occur, including water typing. For more information on water typing and a map that designates the types for major water bodies, see the Washington State Department of Natural Resources water typing webpage (www.dnr.wa.gov/BusinessPermits/Topics/ForestPracticesApplications/Pages/fp_watertyping.aspx)
- Water bodies bordering or adjacent to the project location, including water typing.
- Shoreline Management Areas associated with shorelines of the state, as managed by the State Shoreline Management Act and local Shoreline Master Programs. Shoreline Management Area information should include the Shoreline Environment designation and a description of the approximate extent of jurisdiction. To identify associated Shoreline Management Areas and Shoreline Environment designations, review the jurisdiction's Shoreline Master Program and contact the local permitting official.
- Critical Areas associated with streams, designated pursuant to the Growth Management Act and the local critical area ordinance. Critical areas management information should include the critical areas designation and a description of the extent of jurisdiction.

— Fish and Wildlife Habitat Conservation Areas (name and short description). Fish and Wildlife Habitat Conservation Areas are designated by local governments pursuant to the Growth Management Act. They should include waters of the state (i.e., Type S streams and shorelines), habitats for species that are endangered or threatened (including designated critical habitats and areas where the presence of listed species is documented), habitats for species of local importance, and natural area preserves. The community should have a list of designated Fish and Wildlife Habitat Conservation Areas and/or criteria for designating them.

1.2. Project Area Map

The second item needed for Step 1 is a map, drawn to scale that delineates the following:

— Parcel boundaries
— Area of the finished project (including roads)
— Any additional area(s) that will be disrupted during construction (including access routes, staging areas, and areas to be re-graded or filled)
— All water bodies
— Site topography, soils and geology
— Fish and Wildlife Habitat Conservation Areas
— Existing native vegetation by vegetation community zones. For example, a map could distinguish areas with existing coniferous forest cover vs. areas with existing shrub cover vs. areas with existing meadow cover.
— Boundaries of the following regulatory areas (see Section 3 of the Model Ordinance)
  - Special Flood Hazard Area
  - Floodway

- Riparian habitat zone
- Channel migration area

- Depths of the 10 and 100-year floods at representative locations. This need only be provided where flood data are available from existing studies or the community.

Step 2. Describe the Project Area's Habitat

During Step 2 of the habitat assessment, the applicant describes the existing habitat conditions of the project area. Tasks 2.1 and 2.2 of Step 2 are largely based on existing scientific information on the species use and habitat in the project vicinity.

2.1. Background Research

Step 2 should start with an examination of existing sources of information relevant to threatened or endangered species and their habitats in or near the project area. There may be thorough inventories already available. The following sources should be checked:

- The community's planning or environmental protection department for critical areas inventory maps, best available science consistency studies, designated Fish and Wildlife Habitat Conservation Areas, Shoreline Master Program, flood control and floodplain management plans, and watershed and habitat studies
- The community's parks and/or natural resources departments for natural area studies
- National Marine Fisheries Service critical habitat maps (www.nmfs.noaa.gov/pr/species/criticalhabitat.htm)
- US Fish and Wildlife Service (critical habitat maps (http://criticalhabitat.fws.gov/)
- USFWS National Wetland Inventory maps (www.fws.gov/wetlands/)
- USFWS and NMFS habitat recovery plans, when published for ESA listed species in the project vicinity
    - USFWS: www.fws.gov/pacific
    - NMFS: www.nwr.noaa.gov
- US Department of Agriculture, Natural Resource Conservation Service soil survey maps (http://websoilsurvey.nrcs.usda.gov/app/)
- Washington Department of Fish and Wildlife Priority Habitats and Species Database (http://wdfw.wa.gov/hab/phslist.htm)
- Washington State Department of Ecology Water Quality Assessment (www.ecy.wa.gov/programs/wq/303d/2008/index.html)

2.2. Protected Species Identification

The review of the existing research should identify all federally-listed species and designated critical habitats, Essential Fish Habitat (EFH, defined by the Magnuson-Stevens Fishery Conservation and Management Act) and affected EFH species, and Fish and Wildlife Habitat Conservation Areas *in, overlapping, or within 200 feet of* the project site. The table below is an example of how this information could be presented.

Occurrence of Listed Species and Critical Habitat in or Near the Project Area. (Sample Display)				
Common Name	Scientific Name	ESA Status	Jurisdiction	Critical Habitat Present
Puget Sound Evolutionarily Significant Unit (ESU) Chinook Salmon	Oncorhynchus tshawytscha	Threatened	NMFS	Yes
Puget Sound Distinct Population Segment (DPS) Steelhead	O. mykiss	Threatened	NMFS	None
Coastal-Puget Sound DPS Bull Trout	Salvelinus confluentus	Threatened	USFWS	Yes

To determine what listed or proposed species and EFH may occur in the action area, check with NMFS (www.nwr.noaa.gov) and the USFWS (www.fws.gov/westwafwo/speciesmap.html) to obtain a county list of federally listed/designated and proposed species and critical habitat.

EFH species to be considered in freshwater systems commonly include three species of Pacific salmon: pink, coho and Chinook salmon. If the project area includes estuarine and marine systems, numerous species of groundfish and coastal pelagic fishes may also need to be considered.

This task should summarize the biological and ecological information that will be needed for the habitat assessment. Appropriate information on the species' life history, its habitat and distribution, and other data on factors necessary to its survival, should be included to provide background for analyses in later sections. It is important to note that even though the September 2008 Biological Opinion focused on salmon and EFH, *all* threatened or endangered species in the project area need to be addressed in the assessment.

Existing documents can be referenced, where appropriate. Sources of existing species status information include current NMFS Status Reviews, EFH information, current NMFS and USFWS recovery plans, and Washington State Department of Fish and Wildlife management recommendations (see the References section for links to these information sources). Another source is the locally developed best available science documentation reports, which are required to be prepared by each Puget Sound community for their critical areas standards under the Growth Management Act.

The Corps of Engineers' *ESA Consultation Initiation Template* and NMFS' *Consultation Initiation Template and User's Guide* provide similar guidance. This section's narrative could follow the format and guidance provided in Section III.B Description of Species in these *Templates*. Both the Corps and NMFS use the following outline:

i. Biological requirements
ii. Factors of decline
    a. Historical pressures on the species
    b. Current pressures on the species
    c. Limiting factors for recovery of the species
iii. Local empirical information (if available)
    a. Current local population information
    b. Ongoing monitoring programs (if any)
    c. Population trend of the species

Following the description of the protected species, there should be a summary of the habitat needs for each species. This section of the narrative needs to identify and describe the key factors that are important for the protected species. These should include the primary constituent elements identified in the final rules that list threatened and endangered species. Primary constituent elements are the key habitat components required for an ESA listed species, as identified in the final critical habitat rules and published in the Federal Register for listed species (see example in the box).

Example Primary Constituent Elements

(Chinook salmon and steelhead trout, 50 CFR Part 226, Federal Register / Vol. 70, No. 170 / Friday, September 2, 2005)

1. Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development.
2. Freshwater rearing sites with water quantity and floodplain connectivity
3. Freshwater migration corridors free of obstruction
4. Estuarine areas free of obstruction
5. Nearshore marine areas free of obstruction
6. Offshore marine areas with water quality conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation.

2.3. Site Investigation

Tasks 2.1. and 2.2. give the applicant guidance on where to look and what to look for regarding species potentially present at the site. Following completion of the first parts of Step 2, a site visit is needed to determine if there are habitat areas with which identified species have a "primary association". "Habitats of primary association" include critical components of the habitats which, if altered, may reduce the likelihood that the listed species will maintain and reproduce over the long term. A site visit and determination of site-specific conditions is necessary to determine what actual impacts to ESA listed species, EFH, and associated habitats may occur.

Habitats of primary association include, but are not limited to, winter ranges, migration ranges and corridors, breeding sites, nesting sites, regular large concentrations, communal roosts, roosting sites, staging areas, and foraging areas. This process must identify those areas discussed in Step 2.2 as being primary constituent elements for each ESA listed species within the project area. For example, identification of Chinook salmon habitat areas of primary association should

look for those constituent elements listed in the box above. This field work must include adjacent lands and waters, upstream and downstream of the site.

The description of the project area habitat and conditions should also identify existing modifications to the project site within the Regulatory Floodplain, including existing structures, roads, impervious areas and graded or filled areas. Any existing modification that is impairing habitats of primary association and habitat functions identified and described in the next section should be described. Including activities to restore habitat in these modified areas could help the assessment conclude that there will be no adverse effects to habitat due to the project (see also Task 3.3 of Step 3).

The Washington Department of Fish and Wildlife's *Management Recommendations for Washington's Priority Habitats: Riparian* (see References and Resources section of this guidance) describes common land uses and modifications that impair riparian habitats. The References section lists guidance materials related to other common floodplain and aquatic habitat types.

2.4. Habitat Narrative

The findings of the field investigation are used to prepare a description of the habitat areas of primary association that will need to be protected. The narrative for this part of the assessment report needs to describe the presence and quality of the natural features that relate to the primary constituent elements for all species and habitat areas identified in Tasks 2.2 and 2.3. As described in the final paragraph of Task 2.2, primary constituent elements are the key habitat components required for an ESA listed species, as identified in the final rules and published in the Federal Register when species are listed.

It is possible that there may be limited information available from the sources identified in Tasks 2.1 and 2.2. The habitat narrative should note where this occurs and clarify where statements are based on scientific reports and data and where they are based on the professional opinion of the author.

The habitat narrative includes an assessment of the components and processes for each of the habitats of primary association identified during the site investigation. The narrative should identify what components and processes have a high level of function and what components and processes are impaired by previous site and/or area (i.e. watershed level, basin level) modifications. The narrative should include the following headings for each identified habitat area to ensure that the assessment will cover all items required by the Biological Opinion (Appendix A, part 3) and Section 7.7.B of the Model Ordinance:

A. The primary constituent elements. These are identified in the final rules that designated critical habitat for listed threatened and endangered species (see the NMFS and USFWS critical habitat map links within the References and Resources section to access final rules for ESA listed species). For example, for an inland site with Chinook salmon habitat (see box, previous page), the first three sections of the habitat narrative would cover freshwater spawning sites, freshwater rearing sites, and freshwater migration corridors.

B. Water quality. Discussion of existing water quality should identify water quality levels within project area water bodies and compare existing levels to state standards. The standards for freshwater surface water quality in Washington State are set by WAC 173-201a and are detailed by the Department of Ecology (www.ecy.wa.gov/programs/wq/swqs/criteria.html). Information in Washington State's Water Quality Assessment (303(d)) should be supplemented with any known site specific information (information on 303(d) is found at www.ecy.wa.gov/Programs/wq/303d/index.html). Local and county environmental managers or land use planners should be contacted to assist in identifying relevant water quality information.

C. Water quantity. Site flood dynamics and hydrology should be assessed. Flood and low flow depths, volumes, velocities, and flow paths have an important effect on the way habitat is formed. The habitat narrative should describe these factors with an emphasis placed on the effects of flood events on habitats. Tributary streams, seeps, stormwater outfalls, waterways that pass through the project site, and other water sources should be identified and described. This discussion may rely on and reference other flood and site hydrology studies prepared for the project and should be focused on how flood dynamics and hydrology impact local habitat areas. Generally a qualitative assessment of water quantity should be sufficient, although projects where more significant impacts to water quantity conditions may occur should include quantitative assessment of existing conditions.

D. Vegetation communities and habitat structures. This should include a discussion of riparian vegetation and woody debris, along the banks and throughout the mapped channel migration area. Freshwater riparian conditions should be characterized consistent with the guidance in *Management Recommendations for Washington's Priority Habitats: Riparian*. Characterization of marine shoreline conditions should be consistent with guidance from the Washington State Departments of Fish and Wildlife and Ecology (*Land Use Planning for Salmon, Steelhead and Trout*), and with other Puget Sound nearshore guidance materials listed in the References and Resources section of this guidance.

E. Spawning substrate (only needed for ESA listed fish species)

F. Floodplain refugia (only needed for ESA listed fish species)

2.5. Habitat Area Map

Once all habitat areas of primary association are identified and described, they should be delineated on a map. The map should be to the same scale as the project area map (Task 1.2) to facilitate comparison of the habitat to be protected with the extent of the Regulatory Floodplain, the Protected Area, the riparian habitat zone, and other relevant features, such as watercourses and wetlands.

Step 3. Describe the Project

There are two key parts of the project that need to be described at this stage of the assessment report: the final project, i.e., what the area will look like and how it will be used when the project is completed, and the construction process that will be followed to get there. The final project should be covered first. Measures taken by the developer to prevent or minimize damage to the habitat areas should also be included and highlighted.

As with Task 1.1, if a Washington State Joint Aquatic Resources Permit Application (JARPA) form has been prepared for the project, it will include all project description information required for the habitat assessment. JARPA is under the Washington State Governor's Office of Regulatory Assistance. More information and the JARPA form template can be found at: www.ora.wa.gov/resources/permitting.asp.

If the information is already being provided in a Washington State JARPA that includes the level of detail described in this guidance, the community may accept the application form as sufficient for the project description.

If a Washington State JARPA has not been prepared for the project, the project area description should include the information included in Tasks 3.1 and 3.2 of this section.

3.1. Final Project

All features present when construction is finished should be described. This includes:

- A summary of the project, including all features that will be present when construction is finished
- Project category (industrial, commercial, residential, institutional, transportation, recreational, maintenance, environmental enhancement)
- All structures, including boat launches, fences, docks, and pilings, etc.
- Roads, bridges, culverts, trails, and pavements
- All structures or facilities that would impact water bodies or wetlands, including aquaculture, buoys, mining, bank stabilization, channel modifications, culverts, dams, levees, ditches, fishways, moorage, outfall structures, etc.
- Above and underground utilities
- Water supply
- Wastewater disposal
- Stormwater management facilities
- Non-native landscaping

The level of detail for these descriptions may be generalized for those features located outside the identified habitat areas. The features need to be shown on one or more maps that will facilitate relating the project to the project area map (Task 1.2) and the habitat area map (Task 2.5).

There should also be a description of:

- The ongoing activities that will be conducted at the site
- Ongoing activities that will affect adjacent areas, such as an increase in traffic, an increase in stormwater runoff from the site, increased noise, and changes air quality.

3.2. Construction Process

At a minimum, this section should cover the following points:

- Land clearance (areas to be cleared and native vegetation that will be removed)
- Any work in water, including a description of the methods and materials used
- Grading and filling
- Stormwater management measures taken during construction
- Utility installation (including any on-site wastewater treatment)
- Methods and techniques for construction of structures, including buildings, roads, bridges, paved areas, retaining walls, shoreline modifications, and types of equipment.
- Construction phasing and anticipated construction timing.
- Mobilization and staging plans.
- Temporary construction access and staging areas.

Maps and a timeline are needed to show where and when each activity will occur.

3.3. Protection Measures

There are several Federal, State, and local regulatory requirements for developments to include measures that minimize their impact on the environment. Others may be initiated by the permit applicant. These should be described here. They could include:

- Preserving a setback area from any disturbances
- Drainage/erosion control plan during construction
- Post-construction stormwater/drainage plan
- Use of low impact development techniques (which may eliminate or reduce runoff from areas to be developed)

- Actions to implement wetland mitigation plans
- Compensatory storage provisions to replace lost floodplain storage[1]

Those protection measures that benefit the construction process, such as a sedimentation basin, should be included in the construction process timeline.

Step 4. Assess the Impact

The impact assessment must analyze the direct and indirect effects of the action on the aquatic, riparian, and floodplain habitat areas identified in Step 2, as well as effects of future actions reasonably certain to occur. Primary factors to be considered in the assessment of impacts include:

- Proximity of the action to identified habitat areas
- Distribution, timing, and nature of the effect
- Duration
- Disturbance frequency, intensity, and severity

4.1. Types of Impacts

The References section at the end of this document lists resources that have additional guidance for the assessment of impacts.

Direct effects: According to ESA rules and regulations, direct effects occur at or very close to the time of the action itself. Examples could include construction noise disturbance, loss of habitat, or sedimentation that results from the construction activity. The discussion should include information on the temporal and spatial limits of the effects, species tolerances, severity of effect, mortality and other forms of take, and expected habitat loss as a result of the proposed action.

Direct impacts a project may have on a habitat area include, but are not limited to:

- Permanent clearing and grading of any habitat area;
- Temporary clearing and grading of any habitat area during construction;
- Permanent structures, pavements, etc., constructed within or placed within a habitat area;

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[1] Compensatory floodplain storage requirements are included in Section 7.6 of the Model Ordinance. This section requires that compensatory storage areas must be graded and vegetated to allow fish passage during flood events without creating fish stranding sites. Areas of compensatory flood storage should be designed to create floodplain habitat whenever feasible. Compensatory storage should not be used in areas prone to avulsions because lowering floodplain elevations or digging pits in these areas may increase the probability of an avulsion.

- Modification of a stream channel or side channel including bank stabilization measures and removal or changes to large woody debris (other than stream restoration efforts); and
- Diversion of water that will change the hydrology of the area

Indirect effects: Indirect effects are also caused by or result from the proposed action, however they are likely to occur later in time. They may occur outside of the area directly affected by the action. Indirect impacts include, but are not limited to:

- Disrupting high or low stream flows, including impacts from stormwater runoff;
- Contributing to sedimentation that fills in substrate;
- Blocking a corridor that connects habitat areas;
- Increases in water body temperature and other water quality parameters through removal of riparian vegetation;
- Disturbance of riparian vegetation (for example, clearing vegetation to the edge of a forested riparian area);
- Moving or removing large woody debris;
- Destabilizing banks and modifying channel migration processes; and
- Modifying wetland areas through disturbance of adjacent vegetation or modification of hydrology.

Interdependent and interrelated actions: Determining whether other activities are interrelated to, or interdependent with, the proposed project should be determined by asking the question: *Would the other activities occur in the absence of the proposed project (i.e., do they depend on the project for their justification or have no independent utility without the project)?* If the answer to these questions is "no," then the activities are interrelated or interdependent and should be analyzed with the effects of the action.

Cumulative effects: Under the ESA, cumulative effects include the future effects of State, tribal, local, or private actions that are reasonably certain to occur in the action area. Permit officials are required to review the cumulative effects of a project. If one project has a minimal impact and looks like it should be approved, there must still be a review of the impact of allowing all similarly situated properties to construct similar projects. The result of everyone doing what appears to be a minor project could have a major impact on aquatic and riparian habitat. The permit applicant should keep this in mind during this assessment.

4.2. Report Format

The outline below is a variation on the NMFS and Corps guidance in Section V. Effects of the Action in their *Consultation Initiation Templates*.

A. Direct effects
   1. First primary constituent element (e.g., freshwater spawning sites[2]);
   2. Second primary constituent element (e.g., freshwater rearing sites);
   3. Third primary constituent element (e.g., freshwater migration corridors);
   4. Essential Fish Habitat designated by the National Marine Fisheries Service;
   5. Fish and Wildlife Habitat Conservation Areas;
   6. Vegetation communities and habitat structures;
   7. Water quality;
   8. Water quantity, including flood and low flow depths, volumes and velocities;
   9. The channel's planform pattern and migration processes;
   10. Spawning substrate, if applicable; and/or
   11. Floodplain refugia, if applicable

B. Indirect effects (see the list on the previous page and include consideration of indirect effects to items A.1 through A.11, above, that are applicable to the proposed project.
C. Effects from interdependent and interrelated actions
D. Effects from ongoing project activities (e.g. operations and maintenance)
E. Effects determination
F. Summary

4.3. Effects Determination

An effect determination needs to be made for each identified habitat area. Determinations for each area can then be used to make an overall project effect determination. For example, if there are no effects to all the identified habitat areas, then the overall determination would be that the project would have no effect. However, if some habitat areas are affected, then the project would be determined to potentially have an effect. In such instances, effects determinations for each identified habitat area would inform efforts to mitigate any adverse effects. It is important to document how the effects determinations were reached.

NMFS, USFWS, and the Corps use the following effects determination criteria:

- No Effect (NE): the project has no effect whatsoever to the listed species or designated critical habitat.

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[2] Primary constituent elements are key habitat components for ESA listed species as specified in the Federal Register at the time of critical habitat designation for listed species. See the discussion on page 10 of this guidance for further information.

- May Affect, Not Likely to Adversely Affect (NLAA): the effects to the listed species or designated critical habitat are insignificant and/or discountable. A determination of NLAA would be made for those activities that have only a beneficial effect with no short or long-term adverse effects.
- Likely to Adversely Affect (LAA): the effects of the project will result in a short -or long-term adverse effects on the identified species or designated habitat area.

If the effects determination is NLAA, the report should indicate what minimization and conservation measures would help eliminate or minimize the impact. For example, the permit applicant could time certain construction work to occur when the species are not present in the project area. If such measures do not eliminate the potential adverse effect(s), then mitigation measures will be needed in the mitigation plan (steps 5 – 6).

4.4. Assessment Report

If the assessment concludes No Effect (NE) or May Affect, Not Likely to Adversely Affect (NLAA) (with minimization and conservation measures), then the report should be prepared and submitted to the community's permit office. For NLAA determinations that include minimization and conservation measures, the assessment must include enough detail to show how the measures are related to potential project impacts.

The assessment report should include all the information needed to support the effects determination and the rationale for reaching the conclusion(s). It could be organized to follow Steps 1 – 4 as outlined in this document. The level of detail should be commensurate with the level of anticipated impacts. Projects with significant impacts or potential for significant impacts (due to project type and/or project location) require more detailed review and analysis.

If the assessment concludes Likely to Adversely Affect (LAA) or NLAA and there are no minimization or conservation measures included in the project design, then the assessment will need to proceed to Step 5.

Preparing the Mitigation Plan

The following sections (Steps 5 and 6) provides guidance on preparing a mitigation plan, including reference to other habitat-specific restoration and mitigation guidance materials developed for the Puget Sound region. The final objective of floodplain habitat mitigation should be to ensure that there is no adverse effect to habitat, in terms of features, area, and/or function. Step 6, Task 6.1 of this guidance provides additional guidance on mitigation objectives, including specific requirements for mitigation within Protected Areas and the Regulatory Floodplain.

For many development proposals, permit conditions and mitigation actions required to meet other local and state permit requirements may also provide mitigation for the impacts determined through Step 4 of this guidance. In such instances, permit conditions and mitigation actions may overlap to serve as mitigation for impacts to floodplain habitats as required by the local flood-plain management ordinance. The conditions and mitigation proposed, however, must be

sufficient to mitigate for all floodplain habitat impacts in order to meet the objective of no adverse effect to habitat.

Step 5. Review Mitigation Alternatives (Mitigation Sequencing)

5.1. Avoidance

There are four major types of alternative mitigation approaches to rectify an adverse effect. They are listed in order of preference and effectiveness: avoidance, minimization, restoration, and compensation. They may work independently or in combination. The final objective is to provide sufficient and appropriate mitigation to compensate for habitat impacts, in terms of features, area, and/or function.

Avoidance is the preferred approach. It is recommended that a development project stay out of the Regulatory Floodplain rather than implement activities needed to mitigate the project's adverse effect on aquatic and riparian habitat. Therefore, at this stage, the permit applicant should give serious consideration to relocating or redesigning the proposed project to avoid floodplain habitat impacts and the need for a mitigation plan.

The community may want to encourage the permit applicant to avoid the Regulatory Floodplain with additional incentives. Puget Sound communities currently use many strategies to encourage conservation of certain areas by allowing for development at a more intense level in other areas. These are usually provisions of a zoning ordinance or separate development regulations. There are three approaches, amongst others, that Puget Sound jurisdictions use to encourage conservation:

1. Providing density incentives to individual property owners: A density incentive or density credit system would allow specified land uses to occur at a more intense level within a portion of a parcel outside of the floodplain as compensation for conservation of floodprone areas within the parcel. For example, if a 20 acre parcel is zoned for one acre lots and half of the parcel is in the Regulatory Floodplain, the community might consider allowing the 10 "dry" acres to be developed with half acre lots, allowing the development to still construct 20 homes. This would allow for a higher density of development in a portion of the property and would require the remaining, high habitat value floodplain to be conserved as a dedicated tract. This strategy is similar to clustering development methods, such as is often used in planned unit developments. Under both approaches, the overall project does not exceed the development density allowed by the zoning district.

2. Transferable development rights: Transferable development rights (TDR) systems have been in limited use by certain jurisdictions within the Puget Sound region in recent years. TDR systems allow for the transfer of development density from one parcel of land (with some conservation value, such as a floodplain or wetland) to another parcel or area that is planned for higher density development. Implementation and administration of TDR systems has proven challenging in many circumstances, due to the required coordination in establishing density receiving and density giving areas, and in negotiating density

credit values. However, a community, regional, or watershed based TDR system may be a successful strategy for floodplain avoidance.

3. Tax relief for conservation lands: Tax relief is a financial incentive that has proven to discourage development of sensitive lands. King County has an established system of providing property tax relief for lands that are established as conservation areas. All projects must meet certain criteria and approval is not automatic. Such a system could provide an additional venue to encourage conservation of floodplain lands.

5.2. Minimization

If the entire project cannot avoid the Regulatory Floodplain, it may be that it can be designed to minimize the areas of impact by keeping more disruptive parts of the project out of identified high value habitat areas. For example, while water access may be necessary for the project, the design might place all buildings and pavements out of the riparian habitat zone. Here are some ideas for this approach:

- Site the project footprint away from the higher value habitat areas.
- Designate buffer areas that are not disturbed during or after construction (note that Section 7.4 of the Model Ordinance prohibits disturbing native vegetation in the riparian habitat zone without mitigation).
- Include vegetation enhancement measures around the site's active use areas.

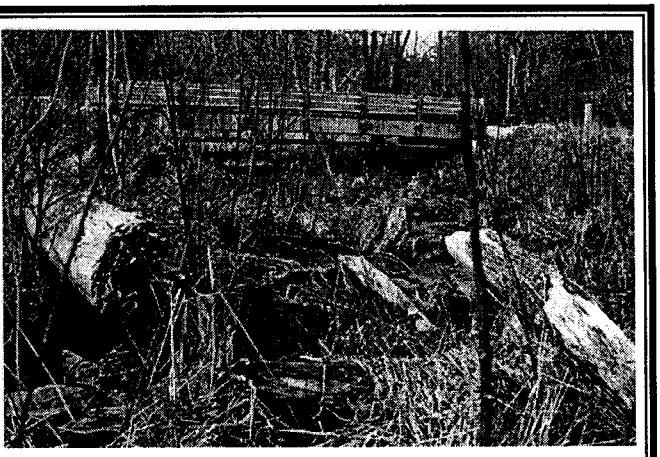
Many adverse effects are due to the disruption caused by construction. Here are some ideas to avoid these types of problems

- Perform all work in dry weather and/or during the dry season
- Incorporate erosion and sedimentation control measures
- Use vegetable oil-based hydraulic fluids in all equipment working in water
- Prepare and train crews on a spill prevention and pollution control plan
- Store, stage, and refuel equipment outside the riparian habitat zone
- Inspect equipment daily for leaks
- Time specific phases of work to occur during "species work windows," when the species are not present or will not be affected

5.3. Restoration

A project's plans should include restoring or improving areas disrupted by the construction process. Wetlands, channels, and riparian areas can be repaired or rebuilt after the land clearance, grading and filling is done. All areas temporarily cleared should be re-vegetated with native plants.

In some cases, restoration projects can be improvements to conditions that existed before the project. The box to the right provides an example, where a Jefferson County stream was enhanced during a bridge replacement project.



When the Tarboo Creek bridge was replaced in 2004, Jefferson County used the opportunity to restore the stream to be more like it was before earlier bridges were built. A long, narrow culvert was replaced with a deeper channel, a wider opening, and woody debris. The former bridge and high stream velocities impeded travel of some species of fish, including salmonids. The new arrangement improves fish passage and carries higher flood flows without overtopping the road.

5.4. Compensation

Restoration measures can mitigate the impact of temporary disruption, as when an area is torn up for construction but intended to remain as open space. Restoration can produce an equal or better habitat at the *same* location.

Permanent changes to the land and water that cannot be avoided will need to be compensated for. Compensation should always produce an equal or better habitat, even though it will be in a *different* location (which may or may not be on the owner's property). It should be noted that the compensation measure must account for the habitat functions and elements identified in Step 2. Some functions, such as a freshwater migration corridor, will not work in a different location.

The applicant should also keep in mind that the area required for compensation is generally greater than the area of impact. Because of the length of time it takes to successfully create a stream side channel, wetland, or upland floodplain habitat area, greater acreage should be provided to compensate for the lost habitat area. (See the Auburn Narrows compensation example, next page.)

5.5. Select the Best Approach(es)

Selecting the best mitigation approaches for the proposed project is an iterative process. It should consider avoidance as the preferred choice. If work must be done in a sensitive area, it should consider the costs of restoration and compensation. If those costs are too high, avoidance should be reconsidered.

Selecting the best mitigation approach can and should be done in conjunction with the local, State, and Federal regulatory offices. Involvement of their knowledgeable staff allows discussion of the approaches and evaluation of preliminary project designs. This can save a lot of work designing the mitigation project. Early and periodic meetings with appropriate regulatory agencies can increase the likelihood of the mitigation plan meeting all regulatory requirements and can reduce potential costs and schedule delays during the approval process.

Auburn Narrows floodplain restoration project along the Green River, King County. This project was funded by a developer of a nearby site in order to compensate for the adverse effect of a floodplain development. The project included creation of side-channel habitat, off-channel habitat, and riparian habitat.

– ESA Adolfson

Step 6. Prepare the Mitigation Plan

6.1. Objective

As noted in Step 5, the objective of the mitigation plan is to assure that sufficient and appropriate mitigation is provided to compensate for habitat impacts, in terms of features, acreage, or function. If the assessment cannot conclude that the project will have No Effect (NE) or May Affect, Not Likely to Adversely Affect (NLAA), then the mitigation plan needs to identify activities that will result in NE or NLAA. The plan document needs to be of sufficient detail to demonstrate how this is done, using avoidance, minimization, restoration, and/or compensation measures.

Objectives for mitigation are differentiated for those impacts occurring within Protected Areas and those impacts occurring within the remainder of the Regulatory Floodplain. Mitigation within the Protected Area must include such avoidance, restoration, and/or compensation measures as needed to ensure that there is no adverse effect to habitat function due to the project. The fourth type of mitigation alternative, minimization measures, are not allowed in the Protected Area, unless they, in combination with other measures, result in no adverse effect to habitat function (Model Ordinance Section 7.8.A.2).

The following are strategies by which the mitigation objective for Protected Areas may be achieved:

- Doubling or tripling the area of compensatory mitigation to increase the mitigation ratio (area of habitat impacts : area of compensatory mitigation provided).
- Identifying additional areas of previously degraded habitat within the project area and developing and implementing a plan to restore them.
- Implementing restoration actions which are targeted as a high priority by an adopted and approved species recovery plan, when such actions are identified within the site and/or within the same basin or reach area, and approved by local, state, and federal permitting agencies.

For all mitigation, the final plan (construction level detail) should not be drafted until the local permitting office(s), in coordination with state and federal agencies, as necessary, has agreed that the conceptual mitigation plan would meet the objective. Coordination with local permitting officers will ensure that the scope of the planned mitigation will be commensurate with the scale of the impacts and will meet the objectives identified above.

6.2. Format

Many communities have tried and true formats for environmental assessments. It may be easier for all involved to keep to that format. Otherwise, Chapter 2 of *Wetland Mitigation in Washington State Part 2: Developing Mitigation Plans* has detailed guidelines on what to include in a mitigation plan. There is a recommended outline in Appendix C of that publication which is geared to larger projects involving complex habitat impacts and mitigation. Smaller less complex projects involving small impacts may not require all the information in the outline because it may not be relevant or applicable.

Here is an example mitigation plan outline;

1. Introduction, background, etc.
2. The project area, with map (taken from Step 1 of the assessment)
3. The project area's habitat, with map (taken from Step 2 of the assessment)
4. Project description (taken from Step 3 of the assessment)
5. Impact on habitat (taken from Step 4 of the assessment)
6. Alternatives considered (taken from Step 5, this should note why some alternatives, especially avoidance, were not selected)
7. Mitigation concept (an overall explanation of the measures)
8. Construction measures
    a. Grading plan, with existing and post-construction topographical maps
    b. Construction methods (e.g. equipment to be used)
    c. Construction schedule

9. Permanent measures

    a. Surface water management
    b. Vegetation plan
    c. Permanent buffer areas
    d. Etc.

10. Post-construction monitoring and maintenance plan

11. Bond arrangements

6.3. Minimum Standards

At a minimum, the mitigation plan's components 7, 8, 9, 10, and 11 should be consistent with the mitigation guidance requirements of the Seattle District of the Corps of Engineers and *Wetland Mitigation in Washington State Part 2: Developing Mitigation Plans* (see Reference section) and with the community's critical areas regulations. If there are inconsistencies between these requirements, the standards that provide the highest level of environmental protection and the greatest likelihood of mitigation success take precedence.

Reviewing Habitat Assessments and Mitigation Plans

This section provides guidance for the local permit official. The following strategies may be used to ensure that habitat assessments and mitigation plans are prepared by a qualified individual or company and meet the intent of the Model Ordinance and this guidance.

Establishing a List of Qualified Consultants: The community could provide a list of qualified consultants to developers and land owners who have experience in the area. Another strategy for ensuring that qualified consultants are used could include developing qualification criteria for authors of habitat assessments and mitigation plans; see the box to the right for an example of one community's criteria.

Example Qualification Criteria

The following qualification criteria could be used by a community to ensure that habitat assessments and mitigation plans are prepared by a qualified consultant:

Reports and plans shall be prepared by persons who have a minimum of a bachelor's degree in wildlife or fisheries habitat biology, or a related degree in a biological field from an accredited college or university with a minimum of four years experience as a practicing fish or wildlife habitat biologist.

When used, qualifying criteria should include specifications for all wildlife, fisheries, habitat, and environmental professionals that could be relied upon to address the broad array of habitats and conditions that occur in floodprone areas.

Public Comment Period: After habitat assessments and mitigation plans are submitted, the permitting official may require a public comment period before assessment conclusions and/or mitigation plans are approved. This approach could include a requirement that public notice be posted in a publication of record. The intent of the public comment period would be to ensure that interested third parties would have ample opportunity to review and comment on proposed projects. This could alert the local permit official to issues or impacts not adequately addressed by an assessment or mitigation plan.

Third Party Review: The community may establish a system of third party review(s) by qualified consultants or agencies. Third party review is frequently implemented by local jurisdictions in the Puget Sound region for other environmental permits and approvals. The cost of third party review could be passed on to the applicant. This may require establishment of a third party review system in the ordinance.

Establishing a system of third party review could augment internal review within the local jurisdiction. Another option for certain jurisdictions could be formalizing a system of internal review where qualified staff would determine the adequacy of submittal materials.

Review Checklists: Permit staff could develop a review checklist for assessment and mitigation plan submittals. A checklist would likely need to be tailored to specific types of development activity due to the site- and habitat-specific nature of habitat assessments and mitigation plans.

References and Resources

Federal and State Regulations

"Endangered Species Act – Section 7 Consultation, Final Biological Opinion," National Marine Fisheries Service, September 22, 2008

Model Ordinance for Floodplain Management Under the National Flood Insurance Program and the Endangered Species Act, FEMA 2010.

NFIP Floodplain Management Requirements A Study Guide & Desk Reference for Local Officials, FEMA 480, 2005, www.fema.gov/library/viewRecord.do?id=1443

Mitigation guidance and JARPA Permit information, Army Corps of Engineers, Seattle District. http://www.nws.usace.army.mil/PublicMenu/Menu.cfm?sitename=REG&pagename=Forms

CRS Credit for Habitat Protection, FEMA, 2010, http://training.fema.gov/EMIWeb/CRS/

Maps and Databases

Critical habitat maps:

- NMFS: http://www.nmfs.noaa.gov/pr/species/criticalhabitat.htm
- US Fish and Wildlife Service: http://criticalhabitat.fws.gov/

Forest Water Typing System: Washington Department of Natural Resources www.dnr.wa.gov/BusinessPermits/Topics/ForestPracticesApplications/Pages/fp_watertyping.aspx

A Framework for Delineating Channel Migration Zones. Washington State Department of Ecology and Washington State Department of Transportation, Ecology Publication # 03-06-027, 2003. http://www.ecy.wa.gov/biblio/0306027.html

National Wetland Inventory maps for the Puget Sound Region, U.S. Fish and Wildlife Service, http://www.fws.gov/wetlands/

Priority Habitats and Species (PHS) Database, Washington Department of Fish and Wildlife, http://wdfw.wa.gov/hab/phslist.htm

Washington Natural Heritage Database, Washington Department of Natural Resources, http://www.dnr.wa.gov/ResearchScience/Topics/NaturalHeritage/Pages/amp_nh.aspx

Washington State Soil Survey data, see the USDA Natural Resource Conservation Service maps or online *Web Soil Survey*, http://websoilsurvey.nrcs.usda.gov/app/

Regional Guidance for Hydrologic and Hydraulic Studies in Support of the Model Ordinance for Floodplain Management under the National Flood Insurance Program and the Endangered Species Act, FEMA Region X, 2010, www.fema.gov/about/regions/regionx/NFIP_ESA/hydrologicandhydraulicstudies.pdf

Water Quality and Quantity

How to Meet Ecology's Construction Stormwater General Permit Requirements: A Guide for Construction Sites, Washington State Department of Ecology, 2008, http://www.ecy.wa.gov/biblio/9937.html

Standards for freshwater surface water quality in Washington State, Department of Ecology http://www.ecy.wa.gov/programs/wq/swqs/criteria.html

Stormwater Management Manual for Western Washington, Washington State Department of Ecology, 2005, http://www.ecy.wa.gov/programs/wq/stormwater/manual.html

Washington State Water Quality Assessment, Washington State Department of Ecology, http://www.ecy.wa.gov/programs/wq/303d/2008/index.html

Water level data:

- US Geological Survey: http://wa.water.usgs.gov/data/
- Washington Department of Ecology: http://www.ecy.wa.gov/programs/eap/flow/shu_main.html

Mitigation

Engineering with Nature – Alternative Techniques to Riprap Bank Stabilization, FEMA Region X, 2009

Floodplain and riparian corridors: Washington Department of Fish and Wildlife (Bolton and Shelberg, 2001) http://wdfw.wa.gov/hab/ahg/floodrip.htm)

Habitat Conservation Planning Handbook, US Fish & Wildlife Service and National Marine Fisheries Service, 1996, http://www.fws.gov/endangered/hcp/hcpbook.html

Land Use Planning for Salmon, Steelhead, and Trout: A Land Use Planners Guide to Salmonid Protection and Recovery, Washington State Department of Fish and Wildlife and Washington State Department of Ecology, 2009, http://wdfw.wa.gov/habitat/plannersguide/index.html

Management Recommendations for Washington's Priority Habitats: Riparian, Washington Department of Fish and Wildlife, 1997; http://wdfw.wa.gov/hab/ripxsum.htm

Protection and Restoration of the Nearshore Ecosystems of the Puget Sound, Puget Sound Nearshore Partnership, 2004, http://www.pugetsoundnearshore.org/technical_reports.htm

Stream Habitat Restoration Guidelines, Washington Department of Fish and Wildlife, 2004, http://wdfw.wa.gov/hab/ahg/shrg/index.htm

Wetland Mitigation in Washington State Part 2: Developing Mitigation Plans, Washington Department of Ecology, US Army Corps of Engineers, and US Environmental Protection Agency, 2006, http://www.ecy.wa.gov/biblio/0606011b.html

Additional References

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Regional Guidance for Hydrologic and Hydraulic Studies

In support of the Model Ordinance for Floodplain Management and the Endangered Species Act

2010

FEMA Region 10

Regional Guidance for
Hydrologic and Hydraulic Studies
in support of the
Model Ordinance for Floodplain Management
under the National Flood Insurance Program
and the
Endangered Species Act

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It was prepared with the advice and assistance of a special advisory committee that included representatives from:

- City of Auburn
- City of Carnation
- City of Everett
- Island County
- Jefferson County
- King County
- City of Lacey
- Lummi Nation
- City of Monroe
- Pierce County
- San Juan County
- Snohomish County
- City of Tukwila
- Washington State Department of Ecology
- Whatcom County
- The National Marine fisheries Service

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Introduction

Background

This Regional Guidance is written for communities in the Puget Sound Basin to assist them in meeting the requirements and criteria of the Endangered Species Act (ESA) as clarified in the Biological Opinion issued by the National Marine Fisheries Service on September 22, 2008. The primary audience for this guidance is engineers and other technical staff involved with mapping flood hazards.

This guidance was prepared with input from local officials, engineers, natural resources scientists, and planners. It will assist local officials and developers determine the most appropriate ways to prepare flood hazard data that meet the requirements of the National Flood Insurance Program (NFIP) and the ESA.

This document is designed to support the NFIP-ESA Model Ordinance, which was also prepared by FEMA Region X.

Hydrologic and Hydraulic Study Guidance

FEMA develops flood data and publishes flood hazard maps to support the NFIP. The data are summarized in Flood Insurance Studies and the maps are known as Flood Insurance Rate Maps (FIRMs). These products define the Special Flood Hazard Area (SFHA), which is the area predicted to be inundated by a flood having a 1-percent probability of being equaled or exceeded in any given year (also referred to as the 100-year flood or base flood). The SFHA designates the minimum area that a community in the NFIP must regulate. The "Regulatory Floodplain," as defined in the model ordinance, is the SFHA plus those areas of riparian habitat and channel migration areas that extend beyond the SFHA.

There are normally three major phases to a FEMA flood study of a stream or river:

1. Assess the flows (usually involving a hydrologic study)
2. Determine flood elevations and the floodway (via a hydraulic analysis)
3. Map the floodplain (SFHA) and floodway

Flood studies conducted for the NFIP are prepared by mapping partners, including state and regional agencies and local governments. FEMA's mapping criteria are spelled out in *Guidelines and Specifications for Flood Hazard Mapping Partners* (called *Guidelines and Specifications* in this document), which are available at http://www.fema.gov/plan/prevent/fhm/gs_main.shtm.

Guidelines and Specifications includes technical appendices which are updated as necessary. The primary technical appendix that relates to the issues discussed in this Regional Guidance is Appendix C: *Guidance for Riverine Flooding Analyses and Mapping* (FEMA, 2002).

This Regional Guidance is intended to supplement existing guidance for communities who wish to prepare studies in consideration of special ESA provisions for Washington State as explained in the Biological Opinion. The Biological Opinion identified three specific areas where study techniques need to be adjusted to provide better hazard data:

- Use foreseeable future land use changes to establish future base flood elevations,
- Use unsteady one-dimensional or two-dimensional hydraulic models to analyze complex riverine systems when applicable, and
- Include the channel migration area as part of the regulatory floodplain.

These three subjects are covered in the following three sections. Communities are not required to use this guidance and it does not define the only approaches to follow. However, communities that do follow this guidance will meet the ESA requirements as spelled out in the Biological Opinion, and have a more effective program to reduce the dangers and damage caused by floods and migrating stream channels.

Each section also includes a discussion of how each of the three major elements of this guidance relate to potential Community Rating System (CRS) credits. More information on the CRS can be found in Appendix D of the NFIP-ESA Model Ordinance and at http://www.fema.gov/business/nfip/crs.shtm.

Future Conditions Floodplain Studies

Background

Flood Insurance Rate Maps serve several purposes:

- They guide local floodplain management programs,
- They establish insurance premium rates, and
- They are used to determine when a flood insurance policy is required under the mandatory purchase requirement.

After a review of the legal issues, FEMA's counsel concluded that FIRMs used for the last two purposes need to be based on the current conditions on the ground. In 2001, FEMA issued a report, *Modernizing FEMA's Flood Hazard Mapping Program: Recommendations for Using Future-Conditions Hydrology for the National Flood Insurance Program*. That report noted:

> As discussed in *Flood Insurance Study Guidelines and Specifications for Study Contractors"* (FEMA 37, January 1995), flood hazard determinations should be based on conditions that are planned to exist in the community within 12 months following completion of the draft Flood Insurance Study (FIS) report. Examples of future conditions to be considered in the context of FEMA 37 are public works projects in progress, including channel modifications, hydraulic control structures, storm-drainage systems, and other flood protection projects. These are changes that will be completed in the near future for which completion can be predicted with a reasonable degree of certainty and their completion can be confirmed prior to the NFIP map becoming effective....
>
> The current procedure for flood insurance rating is that structures shown within the existing conditions 1-percent-annual-chance (100-year) floodplain are subject to a mandatory purchase requirement. Due to statutory constraints at this time, FEMA can not use future-conditions data for flood insurance purposes. Therefore, there will be no change in the use of existing conditions data for establishing flood insurance rates. Through community participation in the CRS, reduced flood insurance rates are available for those communities that enforce more stringent regulatory standards than required by the NFIP. [pages 2 – 3, 5]

While the SFHA on a FIRM cannot be based on future conditions, local floodplain management programs are welcome to use future conditions maps, as long as the regulatory floodplain is at least as large as the currently effective SFHA. In fact, *Recommendations for Using Future-Conditions Hydrology* concludes with a recommendation that FIRMs display the future conditions floodplain for informational purposes. This has been done where requested by the community.

The 2008 Biological Opinion stated:

> The FEMA will also revise map modeling methods to consider future conditions and the cumulative effects from future land-use change, to the degree that such information is available (e.g. zoning, urban growth plans, USGS Climate study information). Future conditions considered should include changes in the watershed, its floodplain, and its hydrology; climate change, and other conditions that affect future flood risk. The FEMA shall ensure that jurisdictions use anticipated future land use changes when conducting hydrologic and hydraulic calculations to determine flood elevations. [page 158]

This section shows how the Biological Opinion requirements can be met within FEMA's current mapping guidance.

Types of Future Conditions

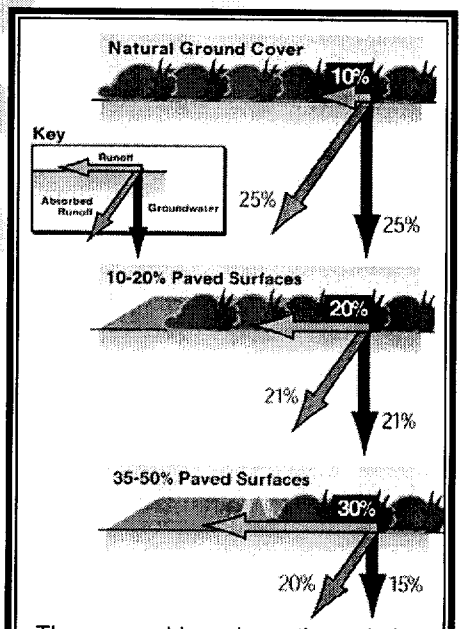
The term "future conditions" has a number of possible meanings in the context of mapping flood hazards. From a flood study perspective, there are two general types of changes that can be expected to occur in the future:

- Changes in the amount of rain and snow that feed floods (climate change), and
- Changes in the watersheds that absorb the rain and snowmelt (land-use changes).

Changes in precipitation: Changes in precipitation due to climate change are possible. Climate varies at many timescales, from daily cycles to the glacial-interglacial patterns that occur over many thousands of years. Changing climate patterns can be difficult to discern because of significant year to year variation and the short observational record.

Flood studies are necessarily dependent on past precipitation and flow records, which do not provide information on flows generated under different climatic conditions. Therefore, existing information is not clear as to how to alter peak flow predictions to account for a changing climate (see for example Brekke et al., 2009, Elsner et al., 2009, Rosenberg et al., 2009). Further, the magnitude of changes in peak flows due to changing climatic conditions is expected to be much smaller than changes resulting from alterations to land use, described below. Therefore, no specific consideration of changes in peak flow due to climate change is included in this guidance.

FEMA is currently developing a report that will assess how a changing climate will affect the NFIP. The report will include estimates of how climate change could impact inland floodplains and coastlands. The report's findings will be incorporated into future versions of this guidance.



These graphics show the relative increase in runoff from a watershed as it is urbanized and the amount of impervious surfaces increase.

– *NAI Toolkit*, ASFPM, 2003

Changes in the watershed: Changes in land use and land cover (e.g., conversion of forest or agricultural land to urban land uses) can have significant impacts on the volume of surface water runoff resulting from a given precipitation event. Changes in land cover typically increase peak flows by greater than 50 percent in small Puget Sound watersheds, and change the timing of peak flows (see the graphic, Booth et al., 2002, Grant et al., 2008).

Forest harvest patterns in managed forest land can also influence runoff patterns. Harvest patterns include re-growth, so it is assumed that future change from these processes is limited, since the bulk of these impacts are already accounted for in past flow measurements.

Land-use and land-cover changes in the watershed are anticipated to have the most significant impacts on peak flows. Therefore, the technical aspects of this guidance are focused on anticipating and planning for flows generated from a more developed landscape.

Other physical changes in the floodplain include infrastructure changes, such as bridge replacement, or land use conversion. If such changes are happening or scheduled within 12 months of a flood insurance study being undertaken, FEMA already requires their inclusion in a new flood study.

Development in the floodplain also has the potential to result in cumulative affects on flood storage. For example, if the fringe is filled, the base flood elevation could rise by up to one foot. To comply with the Biological Opinion, communities will need to prevent filling of the floodplain or include mitigation measures such as compensatory storage so that man-made changes in the floodplain do not affect future flows. In addition low impact development techniques are required for any development allowed within the floodplain. Therefore, development within the floodplain should not have an impact on downstream flood peaks.

On the other hand, there could be natural changes in the floodplain that are not necessarily addressed in *Guidelines and Specifications.* Local critical area regulations encourage preserving the natural and beneficial functions of the floodplain. As riparian plant communities develop, they may provide greater roughness along the channel banks and overbank areas, increasing flood elevations in those areas.

Restoration projects, including levee setback projects, have the potential to change flooding patterns. If an analysis finds that they do affect base flood elevations or the floodway or SFHA boundaries, a CLOMR from FEMA is required. As more projects are completed, they may have a cumulative impact on flood elevations. However, due to their expense, the few restoration projects that have been completed cover relatively short reaches. The distribution and effects of such future projects are difficult to predict. This Regional Guidance does not provide a mechanism to capture this type of future condition.

Conclusion: Development in the watershed has a predictable and measurable impact on the flow regime. This guidance recommends that communities evaluate changes to the base flood from expected future watershed development based on the development patterns laid out in their local long range land use plans. At the request of the community, FEMA will reflect the results of the community-initiated future conditions study on FIRMs when they are revised. The flooding extent determined by future conditions analysis and mapping can be depicted as a shaded X Zone on the FIRM, instead of the 500-year floodplain.

When to Analyze Future Conditions

There are two situations where it is *not* necessary to analyze and map future conditions:

1. Larger rivers: In general terms, the larger the river system, the less potential impact there will be from changing land cover (see for example Grant et al., 2008, Herrera, 2004). These larger systems where future conditions analysis is not required are the "flow control-exempt" water bodies listed in the Washington State Department of Ecology's *Stormwater Management Manual for Western Washington.* The list of these waters is in Appendix I-E of the Ecology manual and Appendix B of this Regional Guidance. The list should be updated in future versions of the Ecology manual.

2. No change expected: Future conditions do not need to be investigated in areas where the contributing basin has already been developed and these conditions are reflected in existing floodplain mapping. For instance, if the contributing watershed is in, and is expected to remain in agriculture or managed forest, these basins do not need to be analyzed for future conditions.

It is most important to capture future conditions for smaller streams that are located in or near areas that are likely to urbanize, such as in or near a city or its urban growth area. For smaller watersheds that are currently undeveloped or only partially developed, it is important to investigate potential changes in peak flows when more than four percent of the overall watershed will become effective impervious surface (Booth et al., 2002). As a general rule, future conditions hydrology should be determined for all cases where over ten percent of a stream's contributing basin is converted from existing forest lands or has an increase in impervious surface.

These criteria are summarized in Table 1.

Situation	Analyze future conditions hydrology?
Study is for a large, flow control-exempt, water body	No
The watershed is developed up to the levels shown in the land use or comprehensive plan	No
The watershed is managed forest or agriculture with *no* potential for conversion	No
> 4% of the watershed will become effective impervious surface, or a >10 % increase is likely if existing condition is >4%	Yes
All other situations	Yes

Table 1. When to analyze for future conditions

Future Conditions Hydrologic Analysis

To develop a reasonable estimate of the future conditions 1 percent annual chance flow, it is necessary to rely on rainfall runoff simulations with altered land use conditions. Gauge analysis has the benefit of using measured data, but the data only reflect past land use, not the future.

All of the currently accepted hydrology models for peak flow determination (available at http://www.fema.gov/plan/prevent/fhm/en_hydro.shtm) can be used to estimate future conditions by changing land cover/use parameters. Some models, such as HSPF and SWMM, will be more amenable to this type of analysis than others. All runoff models should be calibrated to past flood events before they are used for base flood determination.

Future land use conditions can be developed using comprehensive plans developed by communities to comply with the Washington Growth Management Act. These plans specify the type of land uses and, sometimes, percentage of lot coverage allowed during a foreseeable planning horizon, such as 20 years.

It is recommended that a conservative assumption be used that all of the areas in the watershed will be developed as planned. This information can be used in the hydrologic model's land use-to-land cover relationships to describe a build-out condition within the watershed.

Stormwater management regulations usually require stormwater management facilities that will minimize the impact of development on runoff. The 2005 Ecology manual requires that post-development flow quantities be managed using flow frequencies ranging from 50 percent of the 2-year recurrence interval flow to the 50-year recurrence interval flow.

The influence of stormwater management facilities on the 1 percent annual chance flood is considered to be negligible for the following reasons:

- They are required to have overflows sufficient to pass the post-development 100-year flow,
- They can fail due to extreme flood conditions or deficiencies in design, installation, or maintenance,
- Basic retention and detention regulations don't address timing, so there's no assurance that future flooding will not be increased by the facilities, and
- The basic analytical technique is to ignore all private facilities because of long-term maintenance issues.

Future Conditions Hydraulic Analysis

No changes to the existing hydraulic analyses techniques are necessary to develop future conditions floodplain mapping based on land use changes as described above. The same models and approach used for existing conditions can continue to be used with different flows developed in the hydrologic analysis, with the exception of anticipating development of vegetation.

Future conditions discharges are input into the hydraulic model to determine the future-conditions flood hazards. Certain hydraulic parameters may also need to be adjusted based on expected land-use and land-cover changes, as determined by the community.

Vegetation: It is a good floodplain management practice to consider the continuing establishment of riparian vegetation along channel banks and in the floodplain. This development could have significant influence on the study's roughness coefficient. For example, using values from Chow, 1959, a central roughness coefficient (Manning's n) for cultivated land with no crops is 0.030, and a central value for medium to dense brush in winter is 0.070 (in Sturm, 2001). The influence of the roughness coefficient on velocity calculations is linear, so doubling this value will certainly influence the hydraulic calculations, the resulting base flood elevation, and the extent of flooding.

Future conditions hydraulic modeling should consider the potential for riparian and floodplain vegetation to establish and continue to develop. Therefore, future conditions can assume a full riparian forest community (e.g., >50 years old). Agricultural areas can be considered to remain in production and do not require adjustments.

Not all areas will be allowed to develop to full riparian forest. If a community has an operations and maintenance plan (or similar) that includes vegetation maintenance (e.g., to comply with PL84-99), then future vegetation development needs to be as prescribed in the plan.

Future Conditions Summary

Communities should analyze the future conditions flood hazards by using the rainfall runoff models and hydraulic models described in *Guidelines and Specifications*. Future conditions are generally impacted by changes to the land cover conditions. These estimates should be predicted by local land use or comprehensive plans. In summary;

- The use of standard rainfall runoff models with changed land cover conditions to simulate future watershed development should be encouraged to predict future peak flows and base flood elevations. These estimates should assume full build out as predicted by local land use plans.

- Modelers should also consider increasing roughness coefficients within the hydraulic analysis to simulate the continued growth of vegetation within the study area.

CRS Credit for Future Conditions Mapping

The Community Rating System (CRS) is summarized in the separate publication, *CRS Credit for Habitat Protection* and explained in more detail in the *CRS Coordinator's Manual*. Credit toward reducing flood insurance premiums is provided in communities that implement floodplain management measures that are above and beyond the minimum requirements of the National Flood Insurance Program.

As discussed above, floodplain management regulations using a floodplain map based on future conditions is above and beyond the guidance in FEMA's *Guidelines and Specifications for Flood Hazard Mapping Partners*. This can be credited by the CRS, provided:

- The hydrologic and hydraulic study techniques used are recognized in *Guidelines and Specifications*. A technique that is not discussed there may be submitted to the FEMA Regional Office for consideration for CRS credit.
- The study and floodplain map is adopted for use in the community's development regulations. New buildings constructed in the regulatory floodplain must be protected to the future condition's base flood elevation.
- A community may submit the study to FEMA for incorporation into the next scheduled DFIRM update for that community.
- At each CRS cycle verification visit (generally every five years), the community must document whether its regulatory floodplain data still reflect future conditions. For example, a study based on a 20-year land use plan prepared in 1995 will no longer reflect future conditions in 2015.

Regulatory floodplain maps based on future conditions hydrology are credited under Section 411.c. "Future conditions hydrology" is defined in the *CRS Coordinator's Manual* as changes in watershed land use as discussed in the previous pages. If another technique is used to reflect future conditions, an appropriate explanation can be submitted for consideration.

The amount of credit is based on the type of FIRM zone and the amount of the Special Flood Hazard Area shown on the FIRM that is affected by the new study.

Hydraulic Models

Several elements of the Biological Opinion address the selection of appropriate hydraulic analysis techniques. This section reviews how this can be done.

Current Models

FEMA maintains a list of currently accepted hydraulic models for use in floodplain delineation on its website at: http://www.fema.gov/plan/prevent/fhm/en_hydra.shtm. The currently accepted hydraulic models for floodplain mapping fall into one of three general categories: steady one-dimensional (1D), unsteady 1D, or unsteady two-dimensional (2D). Key features of each type of model are shown in Table 2.

The importance of proper engineering judgment in determining the most appropriate hydraulic model is underscored throughout Appendix C to *Guidelines and Specifications*. This judgment should continue to be the primary factor driving model selection.

Model Type	Description	Geometry	Advantages	Disadvantages
Steady 1D	Unchanging flow assumed to travel entirely in the downstream direction	Cross section	• Easiest to set up and run • Efficient mapping tool	• Simplifies flow processes to 1D unchanging in time • Does not capture complex overbank flow processes • Does not address overbank storage
Unsteady 1D	Changing flow (e.g., inflow hydrograph) assumed to travel entirely in the down-stream direction	Cross section	• More accurate timing of peak, especially where multiple sources of water converge • Overbank and structure flows can be simulated using approximations at locations entered by the user • Takes floodplain storage into account	• Simplified flow processes to 1D • Requires specific data input to represent significant water flux into and out of overbank storage areas • Less stable than steady models • Requires additional data development, hydrographs
Unsteady and steady 2D	Changing flow assumed to travel both downstream and laterally across the channel/floodplain	3D Digital elevation model (DEM)	• More realistic simulation of complex flow patterns (e.g., strongly meandering streams, overbank flows, flow compression at bridge piers)	• More data intensive to build DEM • More prone to instability • Needs hydrograph for all major tributaries

Table 2. General characteristics of the three common types of hydraulic models

Another consideration for the selection of models is the level of precision that is required for the results. In many instances, a less precise hydraulic method will still provide sufficient detail for mapping floodplains, especially if appropriately conservative assumptions are made during the modeling and mapping steps.

Regional Guidance

Guidelines and Specifications suggests the use of steady 1D models, except when conditions are too complex for these models to provide satisfactory answers. More complex hydraulic approaches are used when there is reason to believe that a steady 1D model will not produce a reasonable estimate of the base flood elevation. This guidance can be found in Section C.3.4 of *Guidelines and Specifications.*

This Regional Guidance provides more specific advice for applying different models, but is not intended to supersede the technical requirements for applying a specific model provided in the revised Appendix C to *Guidelines and Specifications*.

An unsteady 1D model was used by the Corps of Engineers to develop flood mapping for the Upper Chehalis River. The Chehalis valley near Chehalis and Centralia is a hydraulically complex area that includes the confluences of several major tributaries and significant floodplain storage volume. One product is this map showing flood depths. The use of an unsteady 1D approach in this location has additional benefits in terms of supporting the design and analysis of potential flood mitigation measures.

– NHC

Assessing the hydraulic aspects of the channel and floodplain: Several elements of the Biological Opinion focus on requiring that the NFIP include measures to avoid, minimize, and mitigate potential impacts to floodplain storage and physical habitat provided within the channel and floodplain system. It calls for more complex hydraulic analyses to support the identification of impacts and the determination of appropriate mitigation. Unlike steady-state hydraulic models, unsteady-state models account for floodplain storage. In situations where storage is a concern, unsteady-state models should be considered. The application of an unsteady 1D model will assist in:

- The identification of upstream and downstream impacts (e.g., stage, velocity, duration) of floodplain alterations, and
- The development of appropriate and effective mitigation measures.

Some hydraulic systems are best represented by a 2D model. These instances include:

- Locations with uncertain and potentially changeable flow paths
- Bridges or other locations where flows experience significant lateral flow compression
- Estuaries with flow reversals

For example, the use of a 2D model is common for scour analyses at bridge piers and for the design of fish habitat improvement projects. Flow surrounding bridge piers has a strong lateral component which cannot be captured with a 1D approach. Similarly, a 2D model will be the more appropriate choice to capture post-project conditions for habitat restoration projects that include the use of engineered log jams to create more complex flow processes.

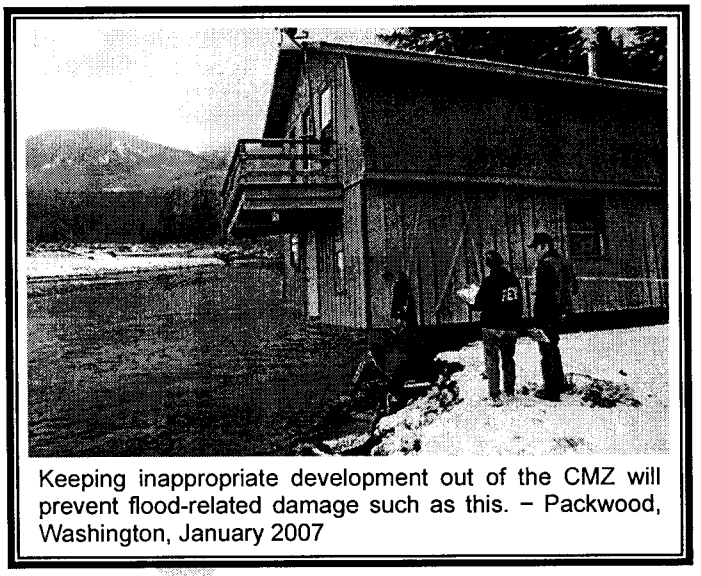
CRS Credit for Hydraulic Modeling

CRS credit is available for some higher study standards. However, this credit is not provided where it is standard practice to use appropriate hydraulic analysis techniques for a given situation, as specified in *Guidelines and Specifications*.

Channel Migration Zones

Background

Dynamic physical stream processes can cause channels to move or "migrate" over time. The area within which a river channel is likely to move over a period of time is referred to as the channel migration zone (CMZ). Channel migration is a severe hazard that converts normally dry ground to a river bed, often by undercutting and destroying buildings, roads, and infrastructure. The hydraulic models approved in *Guidelines and Specifications* do not reflect possible changes in the channel bed during floods.



Keeping inappropriate development out of the CMZ will prevent flood-related damage such as this. – Packwood, Washington, January 2007

The NFIP-ESA Model Ordinance uses the term "channel migration area," which is defined as the mapped CMZ plus 50 feet. That is the area subject to the regulatory requirements of the ordinance. This *Regional Guidance* deals with the hydrologic and hydraulic aspects of mapping the CMZ. Once the CMZ is mapped, the area subject to regulations can be quickly delineated.

While a CMZ does not account for dynamic changes in the channel bed during floods, it does delineate areas subject to the hazard. The CMZ is not mapped as part of a Flood Insurance Study and is not included on FIRMs, but it is appropriate to regulate and include within a community's mapping database.

Biological Opinion Requirements

Identifying the extent of the CMZ is referenced in several parts of the 2008 Biological Opinion:

> The FEMA will ensure that effects from habitat alterations that are reasonably certain to occur but might occur later in time, such as changes in storm water quantity, quality, and treatment, decreased riparian vegetation, lost large woody debris, increased bank armoring, and impaired channel migration, are also mitigated. [page 152]
>
> Bank stabilization measures along salmonid bearing streams, channel migration zones, and along estuarine and marine shorelines must be minimized to the maximum extent possible. [page 224]
>
> No activity is allowed that limits the natural meandering pattern of the channel migration zone, however, natural channel migration patterns may be enhanced or restored [page 224]

The Biological Opinion calls for higher regulatory standards within the Regulatory Floodplain, which includes the CMZ (page 154). Special rules apply in the Protected Area, which includes the channel migration area (CMZ plus 50 feet). FEMA does not require the development of CMZ

mapping, but if mapping has been completed and adopted for local regulatory purposes before September 22, 2008, then this designation shall be used to define the channel migration area.

If a community chooses to map and regulate the CMZ, the mapping should be developed consistent with this Regional Guidance.

Regional Guidance

There are several methods of delineating a CMZ, ranging from approximate to more rigorous technical methods. The Washington State Department of Ecology released a CMZ delineation method in 2003, *A Framework for Delineating Channel Migration Zones* (Rapp and Abbe, 2003) (referenced here as the 2003 Framework). The 2003 Framework was devised to provide a technical framework for delineating the likely CMZ and is intended to be implemented by experienced fluvial geomorphologists.

The 2003 Framework is the method cited in the Biological Opinion as the basis for determining the location of the CMZ. It is also the method recommended for use by this Regional Guidance. Key elements of the method are described here, but this discussion is not intended to provide all of the detail offered in Rapp and Abbe 2003.

The 'design life' (how long into the future the CMZ mapping is intended to capture) of the CMZ mapping is an important consideration that will influence the applicability and use of the study for use as the Regulatory Floodplain. The Biological Opinion specifies that a 100 year timeframe be used. This 100 year time frame should be considered differently than the "100-year" terminology typically used in floodplain management. In floodplain terminology "100-year" is shorthand for an event with a one percent chance of occurring in any given year.

In CMZ delineation, a 100 year design life would establish the area the channel could occupy assuming that current climatic conditions and channel processes continue to occur for the next 100 years. The 100 year design life can be expressed as the potential valley area that the channel can migrate within over 100 years. It is recognized that the relative hazards of migration can significantly vary within the overall CMZ. Communities have, and will, implement variable regulations within the CMZ.

The 2003 Framework identifies four generalized components of CMZ delineation. This approach allows for a more detailed description of physical processes and provides a method to build on each data collection step. In most cases, all of these components will need to be accounted for to establish a CMZ delineation . These components are described in Table 3 on page 15 and shown graphically on page 16.

A number of data sources are available to support this work, as shown in Appendix D of Rapp and Abbe 2003 and Appendix A of this Regional Guidance. The 2003 Framework assumes that these sources will be used in conjunction with some level of field data collection. There is a significant amount of interpretation necessary to accomplish mapping of the various components of the CMZ. Judgments need to be made about data quality at each step, as the resolution of the mapping will always be limited by a finite amount of data.

Element	Description	Notes	Include in the mapped CMZ?
Historical Migration Zone (HMZ) Also referred to as the Historical Channel Occupation Tract (HCOT) see for example GeoEngineers, 2003	The collective area the channel occupied in the historical record	Dependent on extent and quality of past records, including Government Land Office maps, and past aerial photographs	Yes
Avulsion Hazard Zone (AHZ)	The area not included in the HMZ that is at risk of avulsion over the timeline of the CMZ	Dependent on field measurements and identification of vertical channel variation, bank stratigraphy, and the presence and location of relict channels and secondary flowpaths on the floodplain	Yes
Erosion Hazard Area (EHA)	The area not included in the HMZ or the AHZ that is at risk of bank erosion from stream flow or mass wasting over the timeline of the CMZ	The EHA can result from either erosion of the stream bank, or slope failures of the bank that occur after erosion of the toe	Yes
Disconnected Migration Area (DMA)	The portion of the CMZ where man-made structures, such as major levees and Interstate highways, physically eliminate channel migration. In some cases, a levee protects an area that is so important, it will warrant restoring a migrated channel to its earlier location.	Care needs to be taken to assess (1) whether the man-made structures will actually prevent channel movement (e.g., are levees sufficiently engineered?) and (2) whether the structure, highway, or protected area is so important that there is no doubt that after a flood, the channel would be restored to its previous location. Clear evidence of the presence of a DMA would include: Corps certified levees and a local adopted maintenance agreement that states that flood fighting would occur and any damage repaired to prevent channel migration.	Case-by-case

Table 3. Elements of the overall CMZ (Rapp and Abbe, 2003).

Note 1 – In the case where there are features of aquatic habitat existing landward of the levee footprint, the study should show how the habitat would not be impacted by the selection of the levee as a boundary to CMZ hazards.

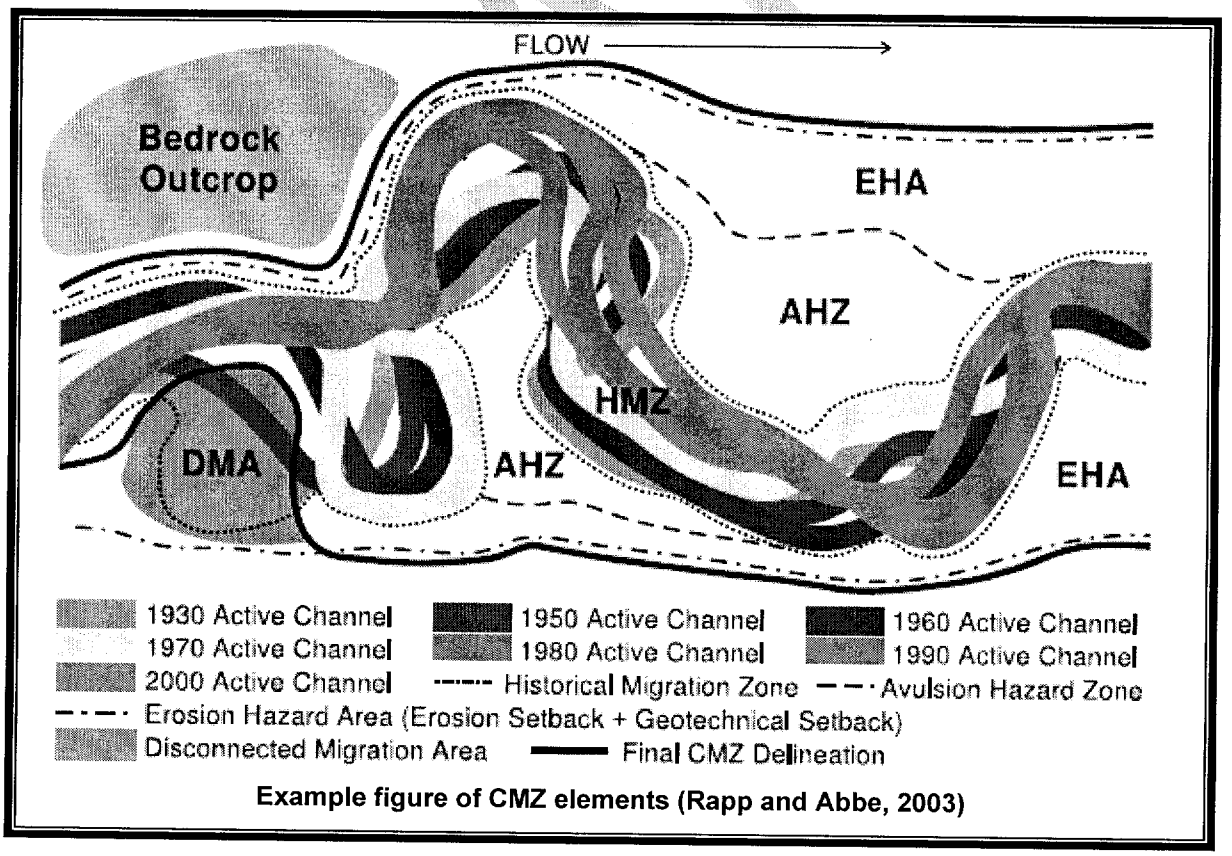
The resultant mapping can include a hazard-based treatment of likely CMZ areas. The approach allows for a ranking of, for example, severe, high, moderate, and low hazard areas throughout the CMZ. This ranking is allowed to be subjective, depending on the mapper's experience and confidence after working through all of the delineation steps. The use of these designations is optional and the criteria used to establish them can be determined by each community.

While the map should show the 100-year design life channel migration zone, the community may adopt only the high hazard portion for its channel migration development regulations. For the purposes of the NFIP-ESA Model Ordinance, the Regulatory Floodplain is based on the channel migration area, which is the channel migration zone adopted by the community for its development regulations, plus 50 feet.

CRS Credit for Mapping Channel Migration Zones

Mapping channel migration zones is covered under the CRS credit for uncertain flow path hazards, found in the *Special Hazards Supplement to the CRS Coordinator's Manual*. A stream subject to channel migration is considered a movable bed stream. A separate supplement is scheduled to be published in 2010.

Credit points for mapping a CMZ are provided if the community also has special development regulations that protect new development from migrating stream channels. The NFIP-ESA Model Ordinance does not include such regulations, as the CMZ is only used to help delineate the Protected Area. Therefore, for CRS credit, the community must have additional CMZ regulatory standards as well as a map prepared in accordance with these guidelines.



Example figure of CMZ elements (Rapp and Abbe, 2003)

The credit for CMZ mapping is provided if the local history of migration is "reflected in the mapping process. For full credit, mapping must be based upon floodplain soils and historic channel migration that indicate the probable extent of future migration." (*Special Hazards* Supplement, page 30.) Any mapping that implements the 2003 Framework or similarly credible methods will receive full credit under this element of the CRS.

Half the CMZ mapping credit can be provided when there are no studies that meet the criteria above. Half credit is provided if a community uses a locally developed standard building setback for unstudied streams in lieu of a detailed study by a developer. Such a locally developed setback standard must be based upon data from the general area regulated.

Appendix A. References

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Appendix B. Flow Control-Exempt Surface Waters

(Appendix I-E to *Stormwater Management Manual for Western Washington)*

Stormwater discharges that are otherwise subject to Minimum Requirement #7 – Flow Control, to waters on this list must meet the following restrictions to be exempt from Minimum Requirement #7.

- Direct discharge to the exempt receiving water does not result in the diversion of drainage from any perennial stream classified as Types 1, 2, 3, or 4 in the State of Washington Interim Water Typing System, or Types "S", "F", or "Np" in the Permanent Water Typing System, or from any category I, II, or III wetland; and

- Flow splitting devices or drainage BMP's are applied to route natural runoff volumes from the project site to any downstream Type 5 stream or category IV wetland:

  - Design of flow splitting devices or drainage BMP's will be based on continuous hydrologic modeling analysis. The design will assure that flows delivered to Type 5 stream reaches will approximate, but in no case exceed, durations ranging from 50% of the 2-year to the 50-year peak flow.

  - Flow splitting devices or drainage BMP's that deliver flow to category IV wetlands will also be designed using continuous hydrologic modeling to preserve pre-project wetland hydrologic conditions unless specifically waived or exempted by regulatory agencies with permitting jurisdiction; and

- The project site must be drained by a conveyance system that is comprised entirely of manmade conveyance elements (e.g., pipes, ditches, outfall protection, etc.) and extends to the ordinary high water line of the exempt receiving water; and

- The conveyance system between the project site and the exempt receiving water shall have a hydraulic capacity sufficient to convey discharges from future build-out conditions (under current zoning) of the site, and the existing condition from non-project areas from which runoff is or will be collected; and

- Any erodible elements of the manmade conveyance system must be adequately stabilized to prevent erosion under the conditions noted above.

Exempt Surface Waters List

Alder Lake	
Aston Creek	Downstream of confluence with George Creek
Baker Lake	
Baker River	Baker River/Baker Lake downstream of the confluence with Noisy Creek
Bogachiel River	0.4 miles downstream of Dowans Creek
Calawah River	Downstream of confluence with South Fork Calawah River
Carbon River	Downstream of confluence with South Prairie Creek
Cascade River	Downstream of Found Creek
Cedar River	Downstream of confluence with Taylor Creek
Chehalis River	1,500 feet downstream of confluence with Stowe Creek
Chehalis River, South Fork	1,000 feet upstream of confluence with Lake Creek
Cispus River	Downstream of confluence with Cat Creek
Clearwater River	Downstream of confluence with Christmas Creek
Columbia River	Downstream of Canadian border
Coweman River	Downstream of confluence with Gobble Creek
Cowlitz River	Downstream of confluence of Ohanapecosh River and Clear Fork Cowlitz River
Crescent Lake	
Dickey River	Downstream of confluence with Coal Creek
Dosewallips River	Downstream of confluence with Rocky Brook
Dungeness River	Downstream of confluence with Gray Wolf River
Elwha River	Downstream of confluence with Goldie River
Grays River	Downstream of confluence with Hull Creek
Green River (WRIA 26 – Cowlitz)	3.5 miles upstream of Devils Creek
Hoh River	1.2 miles downstream of Jackson Creek
Humptulips River	Downstream of confluence with West and East Forks
Kalama River	2.0 miles downstream of Jacks Creek
Lake Cushman	
Lake Quinault	
Lake Shannon	
Lake Sammamish	
Lake Union & Union Bay	King County
Lake Washington, Ship Canal, & Salmon Bay	
Lake Whatcom	
Lewis River	Downstream of confluence with Quartz Creek
Lewis River, East Fork	Downstream of confluence with Big Tree Creek
Lightning Creek	Downstream of confluence with Three Fools Creek
Little White Salmon River	Downstream of confluence with Lava Creek
Mayfield Lake	
Muddy River	Downstream of confluence with Clear Creek
Naselle River	Downstream of confluence with Johnson Creek
Newaukum River	Downstream of confluence with South Fork Newaukum River
Nisqually River	Downstream of confluence with Big Creek
Nooksack River	Downstream of confluence of North Fork and Middle Forks

Nooksack River, North Fork	Downstream of confluence with Glacier Creek, at USGS gauge 12205000
Nooksack River, South Fork	0.1 miles upstream of confluence with Skookum Creek
North River	Downstream of confluence with Vesta Creek
Ohanapecosh River	Downstream of confluence with Summit Creek
Puyallup River	Half-mile downstream of confluence with Kellog Creek
Queets River	Downstream of confluence with Tshletshy Creek
Quillayute River	Downstream of Bogachiel River
Quinault River	Downstream of confluence with North Fork Quinault River
Riffe Lake	
Ruby Creek	Ruby Creek at SR-20 crossing downstream of Granite and Canyon Creeks
Satsop River	Downstream of confluence of Middle and East Forks
Satsop River, East Fork	Downstream of confluence with Decker Creek
Sauk River	Downstream of confluence of South Fork and North Fork
Sauk River, North Fork	North Fork Sauk River at Bedal Campground
Silver Lake	Cowlitz County
Skagit River	Downstream of Canadian border
Skokomish River	Downstream of confluence of North and South Fork
Skokomish River, South Fork	Downstream of confluence with Vance Creek
Skokomish River, North Fork	Downstream of confluence with McTaggert Creek
Skookumchuck River	1 mile upstream of Bucoda at SR 507 mile post 11.0
Skykomish River	Downstream of South Fork
Skykomish River, South Fork	Downstream of confluence of Tye and Foss Rivers
Snohomish River	Down stream of confluence of Snoqualmie and Skykomish Rivers
Snoqualmie River	Downstream of confluence of the Middle Fork
Snoqualmie River, Middle Fork	Downstream of confluence with Rainy Creek
Sol Duc River	Downstream of confluence of North and South Fork Soleduck River
Stillaguamish River	Downstream of confluence of North and South Fork
Stillaguamish River, North Fork	7.7 highway miles west of Darrington on SR 530, downstream of confluence with French Creek.
Stillaguamish River, South Fork	Downstream of confluence of Cranberry Creek and South Fork
Suiattle River	Downstream of confluence with Milk Creek
Sultan River	0.4 miles upstream of SR2
Swift Creek Reservoir	
Thunder Creek	Downstream of the confluence with Neve Creek
Tilton River	Downstream of confluence with North Fork Tilton River
Toutle River	North and South Fork Confluence
Toutle River, North Fork	Downstream of confluence with Hoffstadt Creek
Toutle River, South Fork	Downstream of confluence with Thirteen Creek
White River	Downstream of confluence with Huckleberry Creek
Willapa River	Downstream of confluence with Mill Creek
Wind River	Downstream of confluence with Cold Creek
Wynoochee Lake	
Wynoochee River	Downstream of confluence with Schafer Creek